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ABSTRACT

The situation regarding dental education programs in Florida was studied, with attention to the type and size of programs needed to meet state needs, the geographic location of dental programs, funding and tuition policies, and the state's responsibility to provide an opportunity for its residents to participate in these educational programs. It was found that the supply of dentists in Florida is adequate to meet the demands of the population and also that the problem of chronically underserved populations, such as low-income, rural, and inner-city residents, cannot be addressed simply by increasing the supply of dentists. Among other conclusions are that: the needs of Florida for an adequate number of dentists can be met with the University of Florida College of Dentistry reducing its entering class enrollment by 14 students, or 18%; the University of Florida College of Dentistry should consider expanding the number of general practice residencies; Florida is at present adequately meeting its obligation to provide access to dental education for its citizens; and the University of Florida College of Dentistry should reassess its mission and consider giving greater emphasis to establishing a strong research component, particularly in the areas of geriatrics and gerontology. Data is displayed in 73 tables throughout the text. (SW)

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DENTAL EDUCATION IN FLORIDA

Report and Recommendations of the

POSTSECONDARY EDUCATION PLANNING COMMISSION

U.S. DEPARTMENT OF EDUCATION
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1984 - REPORT 4

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POSTSECONDARY EDUCATION PLANNING COMMISSION

Dental Education in Florida

A Study Prepared in Response to
Appropriation Item 450
of the
1983 General Appropriations Act
(Chapter 83-300, Laws of Florida)

1984 - Report 4

February 29, 1984

EXECUTIVE SUMMARY

Introduction

In a proviso to Appropriation Item 450, the 1983 Legislature directed the Postsecondary Education Planning Commission to:

> develop a comprehensive health professional education plan for the state. During the 1983-85 biennium, priority shall be given to determining the needs in the undergraduate and graduate medical and dental education programs...The review shall include an analysis of the type and size of programs needed to meet the state's needs, the geographic location of such programs, the funding and tuition policies, and the state's responsibility to provide an opportunity for its residents to participate in these educational programs. The Commission shall provide a report to the Legislature no later than March 1, 1984 on dental education and no later than January 10, 1985 on medical education. These reports will address both immediate and long-range plans to meet the needs of these two programs and a method of maintaining these plans up-to-date.

Review of dental education is occurring throughout the country as dental schools face a web of problems. The country's schools began to expand dramatically in the mid-1960's to meet a projected national need. Fueled with millions of dollars in federal financial support, the number of schools and their facilities and faculty were greatly expanded. Fourteen new schools opened in the last two decades. However, public policymakers and educators now agree that the demand for dental care has largely been met. Many think there is now a general surplus of dentists even though dental care remains in short supply in certain geographic areas.

Educational governing boards and coordinating agencies in a number of states are reassessing the need for dental education in their states. The Kentucky Council on Higher Education has recommended an enrollment reduction of about 25 percent at the state's two dental schools. The University of Washington has reduced its enrollment from 100 to 60 students. The Illinois Board of Higher Education recommended that beginning class enrollment at four dental schools in the state be reduced by ten percent. This report will review nationwide trends in dental practice and dental education and analyze the supply of and demand for dental care in Florida. The present array of educational programs for dentists, dental hygienists, dental assistants and laboratory technicians will be analyzed and recommendations offered to improve the quality and assessibility of dental care in Florida and to promote cost-effectiveness in dental education offerings.

The State of Florida has only one dental school, the state-supported College of Dentistry at the University of Florida. Florida has avoided the over-expansion of dental education that occurred in many states when federal monies became so readily available. The College is one of the newest in the country, has an innovative, nationally renown, self-paced curriculum, and has a strong regional reputation. Though many people feel that the country is entering a period of oversupply of dentists, Florida is a large, growing State. The Commission believes that the State is well-served by having one institution of high quality.

Postsecondary Education Planning Commission members and staff have met with members of the dental professions and educators in dental programs to assess the State's needs for dental care and for dental education. Meetings have been held between members of the Commission staff and the Florida Dental Association, the Florida Board of Dentistry, the Florida Association of Dental Hygienists, the Dental Health Office of the Department of Health and Rehabilitative Services, the dean and faculty members of the University of Florida College of Dentistry, and deans, directors and faculty of public and proprietary dental auxiliary programs. The Commission found the recent report of the American Dental Association's Special Committee on the Future of Dentistry of particular value and timeliness in the preparation of this report.

The Supply of and Demand for Dentists in Florida

The increased production of dentists nationally over the last two decades has significantly increased the dentist-to-population ratio in the United States. Florida has seen an even greater increase because the State has attracted so many dentists from around the country. In fact, Florida is the number one destination for dentists moving from one state to another. Though Florida has fewer dentists for its population than the national average, it has more than most of the other southern states.

Though no consensus can be achieved on the number of dentists needed in Florida, it is widely believed among health professionals and health manpower planners that Florida has an adequate number of dentists and many people feel that Florida has an oversupply of dentists. The Commission received considerable testimony from practitioners on the lack of business by many dentists and on the difficulty new dentists have in attracting a sufficient number of patients to support a practice. In a 1981-82 survey of licensed dentists in Florida, 65 percent reported that there were more than an adequate number of dentists in their area, 33 percent reported that there were an adequate number and less than two percent reported there were an inadequate number.

One indication of the adequacy of the present supply of dentists is the fact that public institutions, which have suffered from a chronic shortage of health professionals, report that they are presently able to employ dentists. In fact, the Department of Health and Rehabilitative Services Public Health Dental Program has announced that for the first time in recent memory, there are no vacancies for dentists in any of the institutions.

1. The supply of dentists in Florida is adequate to meet the demands of the population.

The State of Florida has had two critical areas of need in the past: rural communities and low-income, inner-city populations. The Department of Health and Rehabilitative Services reports that access to dental care has improved significantly for rural communities over the last few years. While underserved areas still exist, the problem is no longer caused by an insufficient supply of dentists. Rather, such areas have not been able to attract dentists because there are not enough people in the community with the economic resources to support a dental practice. Similarly, people in the inner-city who are not receiving needed dental care simply do not have the money to pay for dental services. There is no reason to presume that increasing the overall supply of dentists will improve access for these underserved populations.

2. The problem of chronically underserved populations such as people who live in rural communities and low-income, inner-city neighborhoods cannot be addressed simply by increasing the supply of dentists.

Enrollment Level at the University of Florida College of Dentistry

Florida presently has one dental school, the University of Florida College of Dentistry, which has an entering class of 80 students. In 1981-82, the College of Dentistry enrollment was increased from 66 to 80. Though Florida has a low number of dental school slots, the majority of dentists in Florida who pass the Florida Board each year are from out-of-state. Likewise, one-third of the dentists who hold Florida licenses reside out-of-state and could move to Florida and set up practice at any time. From in-state migration and the annual graduates from the University of Florida, the dental manpower needs of Florida are presently being adequately met. In fact, many people believe that Florida is or shortly will be entering a period of oversupply.

Reductions in enrollment are occurring or being recommended at dental schools across the country. The American Dental Association Council on Dental Education has estimated that enrollment reductions must be of an order of 20 to 25 percent to realize any significant cost savings because so many of the instructional costs are fixed. If the enrollment at the University of Florida College of Dentistry were rolled back to the 1981-82 level of 66 students in the entering class, it would represent an 18 percent reduction sufficient to achieve some cost savings in undergraduate dental instruction.

3. The needs of the State of Florida for an adequate number of dentists can be met with the University of Florida College of Dentistry reducing its entering class enrollment by 14 students or 18 percent.

The last few years have seen a considerable expansion across the country in dental general practice residencies (GPRs). These one-year residencies are taken by dental students immediately upon graduation usually in a teaching hospital. The resident receives a stipend from the hospital and practices there but is also under the supervision of a faculty member and attends seminars and lectures.

Increasingly, graduates of dental schools are reporting a need to develop their clinical skills beyond the level permitted in a four year curriculum. The University of Florida presently has six GPR slots for which there were 76 applicants in 1983.

4. The University of Florida College of Dentistry should consider expanding the number of general practice residencies.

Access to Dental Education

Florida has considerably fewer slots available in-state for citizens who seek dental education than most other states. The national ratio is 2.69 slots per 100,000 population. Florida's ratio is 0.67 or only one-fourth of the national average. Prior to the academic year 1982-83, Florida residents could pursue dental education at Emory in Atlanta at in-state tuition rates through a Southern Regional Education Program (SREB) compact agreement. In 1981-82, forty-nine Florida residents pursued this option and in 1982-83, twenty Florida

residents participated in the program. It has now been discontinued. In 1982-83, thirty-nine Florida residents (in addition to the twenty at Emory) attended dental schools in other states.

On the surface, this may appear to warrant additional access for in-state students. Public policy regarding access to education is substantially different in areas of professional preparation than in undergraduate education. Dental education is a narrow and highly-specific field of training and skills acquired are not transferable to other occupations or endeavors. It is also a very costly program requiring expensive equipment and an extremely low faculty-student ratio. A state's responsibility to provide equitable access for citizens wishing to pursue dental education must be balanced against the state's need for dental manpower and competing state priorities for funding. The State should not expand access to dental education only as a response to student demand when the best information available indicates that the demand for dental services does not justify additional dentists.

5. The State of Florida is presently adequately meeting its obligation to provide access to dental education for its citizens.

Mission of the University of Florida College of Dentistry

The University of Florida College of Dentistry is moving into its second decade. The College should now consider re-examining its mission with an increased emphasis on establishing excellence in dental research. The College is one of the newest in the country and is widely considered one of the finest in the South. It should strive to attain national prominence in its research efforts, both basic and applied. The College should strive to become a national leader in research endeavors which may most benefit Florida's elderly population.

6. The University of Florida College of Dentistry should reassess its mission and consider giving greater emphasis to establishing a strong research component, particularly in the areas of geriatrics and gerontology.

Tuition Level and Student Indebtedness

Tuition and fees at the UF Dental School are $2,037.00 per 12 months, slightly below the mean at other public schools in the south and significantly below the mean at the public schools in the ten largest states. Tuition at public dental schools has increased 252 percent in the past ten years. Student indebtedness has also increased significantly. Indebtedness for students at public dental schools is now at $17,000 and is expected to double in the near future for many students. A drop has already been registered in the number of lower middle-income students applying to dental schools.

In the Commission's recommendations on tuition and financial aid, the Commission established the policy that both the State and the student should bear an equitable portion of the financial burden. At present, in-state dental students pay approximately eight percent of the costs of their education. This is substantially less than the share paid by community college and undergraduate university students. In addition, dental graduates are likely to maintain an income considerably higher than the public-at-large. At present, the income level of dentists is in the top four percent nationally.

The Commission recommends that in-state dental school tuition be raised to $4,000.00 to bring the share of the costs of education in line with undergraduate education. Further increases should not be pursued until the impact of this raise on the mix of applicants is determined. The question of access for low-income or minority students should be addressed through financial aid programs.

7. Tuition and fees at the University of Florida College of Dentistry should be raised to $4,000 per year or roughly 15 percent of instructional costs. The increase should be phased in over a two-year period. For Fall 1985 the tuition and fees should be raised to $3,000 and for Fall 1986 the tuition and fees should be raised to $4,000.

State Financial Aid Programs or Service Commitments

Between 1955 and 1968 the State of Florida offered stipends to dental students who at that time pursued dental education outside the State. The student could either pay back the loan at what was at that time a stiff interest rate (eight percent) or provide service to the State by (1) setting up practice in an under-served area or (2) being employed at public institutions such as a mental institution, Sunland center or other. The program was discontinued in 1969 when the Legislature determined that the program had largely served its purpose.

While the dental care needs of certain populations are still not being met, the Commission does not feel that the establishment of a service commitment financial aid program would help address the needs. Most of the geographical areas presently underserved do not have the resources to support additional dental manpower and the State would be placing a burden on a student by requiring that he or she set up practice in such an area. Moreover, the supply of dentists is such that public institutions are now able to meet their staffing needs.

8. At this point, the remaining problems of maldistribution of dental manpower cannot be addressed through the educational system.

Dental Needs of the Elderly

The dental needs of the elderly are of prime concern to Florida. Florida is the oldest state in the nation as measured by the median age of the populace. It has the highest percentage of persons aged 65 and over in the nation and in 20 years will have the greatest absolute number of elderly persons. The considerable anticipated growth in the Florida population will be among older persons. These persons aged 35 and older are projected to account for three-fourths of the state's population increase between now and the end of the century. The dental needs of older people are considerably different from those of younger people. For example, by age 35 the average American has lost five teeth. Periodontal disease is the most common cause of tooth loss in persons over 35 years of age. Advanced periodontal disease exists among 37 percent of adults 45 to 64 and 50 percent of persons aged 65 to 74. Also, the dental needs of elderly people are changing. It is possible that the effect of lifetime exposure to fluoridization may decrease the prevalence of periodontal disease. Likewise, it is anticipated that the loss of teeth by the elderly will decrease gradually. The mix of dental services needed may be changing. As a larger percentage of people retain their teeth into old age, demand for preventive,

restorative, periodontic, endodontic and fixed prosthetic services may increase while demand for extractions and removable prostheses may decrease. Elderly individuals confined to nursing homes or homebound are less likely to travel to dental offices than people who are mobile. Proper preventive care (flossing and brushing) becomes more difficult and access to professional dental care is impaired. Approximately 1.3 million persons are in nursing homes representing at any one time about five percent of the population. Of these, 60 percent or more have immediate dental needs, with their last visit to the dentist occurring six years ago, and the average age of their dentures exceeding ten years. The oral health problems of the elderly and chronically ill or disabled in nursing homes are considered to be far more serious than oral health problems among the rest of the population, including the elderly outside nursing facilities.

The College of Dentistry has recently appointed a new dean, Dr. Donald Legler, who has considerable expertise in the areas of geriatrics and gerontology. Under his leadership, the College of Dentistry administrators and faculty should assess the needs of the elderly for dental care on an ongoing basis and ensure that clinical and didactic instruction includes scientifically-based knowledge and clinical experience concerning the elderly. Topics such as prosthodontics, periodontal disease, endodontics, replacement restorations and management of secondary and root caries should be emphasized. Access to older patients should be pursued through out-reach programs such as those presently being developed in Jacksonville and St. Petersburg. Internships should be offered in nursing homes. Faculty professional development should be instigated to assure that faculty are current in the research, instruction and public service implications of the increasing numbers of the elderly. In conjunction with the Florida Dental Association, the needs of practicing dentists for professional continuing education on the dental needs of the elderly should be addressed and appropriate instruction offered.

The University of Florida College of Dentistry is one of the newest colleges in the country and has already distinguished itself in a number of instructional and research areas. With the appointment of a new dean, it has the opportunity to establish national prominence in the area of dental care for the elderly.

9. The University of Florida College of Dentistry should consider designating geriatric dentistry as a top priority for research and instruction.

Continuing Education

The recent American Dental Association Study on the Future of Dentistry highlighted the importance of the effective transfer of new knowledge and techniques to practicing dentists and, in particular, recommended the expansion of the role of dental schools in improving the transfer to the practicing profession. The Commission recognizes the strong commitment of the UF College of Dentistry to helping the practicing dentists in Florida keep abreast of professional, scientific and technical advances in the profession.

10. The University of Florida College of Dentistry should continue its service to the State by offering continuing education courses throughout the State. The dental needs of the elderly should be of the highest priority. Clinical instruction should be offered utilizing the faculty and equipment of the college.

Public Health Dentistry in Florida

The Department of Health and Rehabilitative Services in conjunction with the local county health departments delivers direct dental care, preventive dental care and dental care prevention education to underserved populations throughout Florida.

11. The clinical and research faculty of the College of Dentistry should work closely with the Department of Health and Rehabilitative Services Public Health Dental Program to improve the delivery of direct care and preventive and educational services to the targeted populations. More research is needed on the role of the dental hygienist, in particular, in the delivery of direct care in community settings.

12. The planned College of Public Health at USF should review the curriculum of the Master's in Public Health to establish the appropriate role of public health dentistry in the curriculum. Because public health personnel tend primarily to be physicians and nurses, it is important that the dental health needs of communities be presented in the professional degree program.

Graduates of Foreign Dental Schools and Licensure in Florida

Concern has been expressed over the large number of dentists who are trained in foreign dental schools and who seek licensure in Florida. Florida is one of only 17 states (and the only one in the South) that does not require additional education for foreign graduates in a U.S. dental school. Foreign graduates are required to have completed the National Board of Dental Examiners Written Examination or National Board Equivalency Written Examination and to complete a mannequin examination administered by the Florida Board. Currently, no examination of the educational process the student underwent is required. If the student can pass these two exams, he or she will be allowed to practice in Florida. The Department of Professional Regulation has recently submitted to the Legislature a review of the licensure process for residents who have graduated from foreign professional schools. The report recommends the establishment of a Foreign Graduate Clearing House which would be responsible for on-site reviews of any non-accredited foreign institutions whose graduates wish to obtain licensure in Florida. The institution would bear the cost of the on-site inspection and any further visits that might be required to assure compliance with established standards.

The Commission agrees with the direction taken in the report stressing that the process of education received by a candidate for licensure from an unaccredited institution must be subject to examination by the State, to include review of the curriculum, faculty and facilities of non-accredited schools. Other states, New York in particular, are presently developing their own review process. Florida might wish to join with other states faced with large numbers of candidates from foreign schools and develop program review criteria in consort. To address both the responsibility of the State to maintain the highest levels of professional standards and the rights of Florida residents to pursue a livelihood for which they are trained, proper review procedures must be established.

13. The State of Florida should develop a program review process and criteria to evaluate the adequacy of training received by graduates of unaccredited dental schools who present themselves for licensure in Florida and students in unaccredited schools who seek to obtain clinical internships in institutions in Florida.

Education for Dental Hygienists, Assistants and Laboratory Technologists

Florida has eight dental hygiene programs, twenty-three dental assisting programs and ten dental laboratory technology programs. After considerable expansion in the number of programs and students over the last twenty years, the State has recently experienced a stabilizing and even a slight decline in student demand and enrollment. Projected employment opportunities for the State indicate that projected demand will be adequately met at present enrollment and completion rates and by in-migration of trained professionals from other states.

14. The State should not expand the number of dental hygiene, assisting or laboratory technology programs.

15. If student demand continues to drop for dental hygiene, assisting or laboratory technology programs, consideration should be given to enrollment reductions or possible termination.

The number of students and the need for trained professionals vary by region. Consideration for expansion or reduction in enrollments must be reviewed at the regional level.

16. If need can be substantiated in the future, priority should be given to expanding existing dental hygiene programs in the East and West Central regions and existing dental laboratory technology programs in the West Central region.

The placement rates for dental hygiene, assisting and laboratory technology programs vary considerably among institutions. The State Board of Education has recently adopted a 60 percent placement standard for all public vocational programs. The Commission is proposing that all programs that do not achieve a 75 percent placement rate be reviewed.

17. Programs whose placement rates achieve less than the 60 percent standard adopted by the State Board of Education should be reviewed by the State Board of Community Colleges and Division of Vocational Education for possible adjustment or termination. The placement standard should be revised to 75 percent during the second five-year cycle of program reviews.

As the placement information becomes more central to statewide policy analysis, it becomes more important that the enrollment, completion, and placement information be as accurate as possible. One way to improve the information is to involve the program directors more closely in the collection and reporting of the information.

18. The dental hygiene, assisting, and laboratory technology program directors should be more directly involved in the collection and reporting of program information.

The lengthening of the time required for training in all allied health programs and the inflation in the degree required for job-entry is of concern to educators throughout the country. The Commission's report on vocational education has drawn attention to the need to differentiate more finely between Associate of Science programs and certificate programs.

19. The practice of awarding Associate of Science degrees to students in dental assisting and dental laboratory technology programs should be reviewed by the State Board for Vocational Education. The Board should develop guidelines to determine when a field of study has reached a level requiring more technical complexity and more general education making an Associate of Science degree program more suitable than a certificate program.

20. The disparity in the number of credit hours required for graduation from dental hygiene programs should be reviewed by the State Board of Community Colleges, particularly in light of concern over the length of the curriculum. Greater consistency statewide should be required. Systemwide policy should be developed for the conversion of clinical hours into credit hours.

The licensure passing rates of dental hygiene programs are an important measure of the quality of education received and the State should monitor the passing rates of dental hygiene program completers.

21. The State Board of Community Colleges should develop standards for licensure passing. Programs failing to meet the standards should be targeted for program review and possible termination.

The low number of minorities, especially blacks, who enter and complete health profession training programs is of considerable concern because of the low health status of many minority populations.

22. The State Board of Community Colleges should make sure that dental hygiene, assisting and technology programs are included in the efforts to achieve eight percent black enrollments in allied health programs. Closer ties should be developed between minority students and minority practitioners in the field.

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I. INTRODUCTION

In a proviso to Appropriation Item 450, the 1983 Legislature directed the Postsecondary Education Planning Commission to:

> develop a comprehensive health professional education plan for the state. During the 1983-85 biennium, priority shall be given to determining the needs in the undergraduate and graduate medical and dental education programs...The review shall include an analysis of the type and size of programs needed to meet the state's needs, the geographic location of such programs, the funding and tuition policies, and the state's responsibility to provide an opportunity for its residents to participate in these educational programs. The Commission shall provide a report to the Legislature no later than March 1, 1984 on dental education and no later than January 10, 1985 on medical education. These reports will address both immediate and long-range plans to meet the needs of these two programs and a method of maintaining these plans up-to-date.

Review of dental education is occurring throughout the country as dental schools face a web of problems. The country's schools began to expand dramatically in the mid-1960's to meet a projected national need. Fueled with millions of dollars in federal financial support, the number of schools and their facilities and faculty were greatly expanded. Fourteen new schools opened in the last two decades. However, public policymakers and educators now agree that the demand for dental care has largely been met. Many think there is now a general surplus of dentists even though dental care remains in short supply in certain geographic areas.

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State's needs for dental care and for dental education. Meetings have been held between members of the Commission staff and the Florida Dental Association, the Florida Board of Dentistry, the Florida Association of Dental Hygienists, the Dental Health Office of the Department of Health and Rehabilitative Services, the dean and faculty members of the University of Florida College of Dentistry, and deans, directors and faculty of public and proprietary dental auxiliary programs. The Commission found the recent report of the American Dental Association's Special Committee on the Future of Dentistry of particular value and timeliness in the preparation of this report.

II. THE NEED FOR DENTAL CARE

Dental cavities and periodontal disease together represent one of the most serious problems in the health field today. Though no comprehensive studies of oral health of Florida's citizens exist, surveys conducted on a national level have documented that cavities and periodontal disease are nearly universal. In the 1970s, 64 percent of the United States population aged one through 74 needed some type of professional dental care. Approximately half the population between the ages of six and 45 need treatment for cavities and about one-fourth of the people between the ages of 19 and 64 need fixed or partial bridges. Critical for Florida's population is the finding that 25 percent of adults between the ages of 64 and 74 need full denture construction. Advanced periodontal disease has dramatically increased as patients have retained their teeth into older ages. Furthermore, past trends in dental disease are undergoing important changes. Many people are keeping their teeth for a longer period of time. The average number of filled teeth per person has increased while the number of missing teeth has decreased. There has been a significant decrease in the number of cavities in children. Nearly 37 percent of the children between five and 17 years old are completely free of cavities.

Access to Dental Care for Minorities

Since the implementation of the social programs and civil rights legislation of the 60s, improvements have occurred in the health status of blacks. There is, however, greater disparity between black and white utilization of dental care than that of medical care. According to a 1978 Robert Wood Johnson Foundation Report, 61 percent of urban blacks did not see a dentist, while 37 percent did not see a physician. The same study revealed that 82 percent of southern rural blacks did not see a dentist as compared to 35 percent who failed to see a physician. The total population percentages were 51 percent who did not see a dentist as compared to 28 percent who did not visit a physician.

Low-Income Population

There is a vast difference in utilization of dental services between the poor and middle to upper income groups. While low-income school-age children are receiving more care than in the past, they do not receive the same services as more affluent children. Approximately 40 percent of poor adults in the 25-44 age group have dental visits, as compared with 63 percent of the adults. It is estimated that 43 percent of the poor who are 45 years old have lost their teeth as compared with 15 percent of the non-poor. While Medicaid has included dental care in 35 of the 50 states, the national average of dental benefits paid is only 2.5 percent of total benefit expenditures. Low income citizens who live within reasonable closeness to one of the nation's 60 dental schools are able to obtain care in the school clinics where supervised students provide treatment. In certain locations children are receiving oral health education and preventive service in school. Those programs which provide fluoride in non-fluoridated areas are significantly restricting dental disease.

The Elderly

Persons over 65 must contend with reduced earning power, increased health expenses, and often growing physical dependence on others. The nature of the needs of this group has changed in the recent past. Since over 40 percent of

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today's elderly population is not in need of dentures, the need for comprehensive dental services has increased. Their ability to pay for such services has increased.

One particular group in need of dental services are those residents of nursing homes and persons who are homebound. This group is particularly difficult to serve because of lack of mobility. Only recently has mobile dental equipment been designed. There are no statistics which reveal the amount of service being provided in this area. Historically dentists have been reluctant to practice in long-term care facilities which are not properly equipped though some care has been provided by dental schools, dental societies and individual dentists. Indications are that this group will grow in size and need for comprehensive dental care.

The Handicapped

Approximately 33 million of the American population can be identified as having chronic physical, mental or emotional conditions. Four million are younger than 18 years of age, 18 million are between 18 and 64 years of age, and 11 million are 65 or over. Approximately 2 million are in institutions, 2 million are homebound, and 2 million are so limited in mobility that they need special aids or assistance. Periodontal disease is almost universal among the handicapped, and they have high incidence of untreated dental decay, poor oral hygiene, and missing teeth.

Prior to 1974 there was little dental education which dealt with treatment for the handicapped. At that time programs funded by the Robert Wood Johnson Foundation were begun in 11 dental schools. More than 4,000 students who participated are now qualified to treat the handicapped.

Public Health Dental Programs

The Office of Public Health in the Department of Health and Rehabilitative Services reports that there are approximately 120,000 people in Florida who are in need of dental services but are not able to afford it. There are approximately 750,000 children in grades K-12 who live in non-fluoridated areas and are targeted for the preventive public health program. Approximately a million and half people are targeted in the public health dental screening and education program.

III. CURRENT AND FUTURE DEVELOPMENTS IN DENTAL CARE

The last thirty years have seen remarkable progress in the dental health of the country and in the ways in which dental care is provided. No achievement has been more impressive than the reduction of cavities in children due to the fluoridization of water. In fact, a recent study showed that almost forty percent of children were completely free of cavities. These results provided one of the first definitive confirmations of the positive relationship between exposure to fluoride and reduction in cavities. The productivity of an individual dentist has also been improved considerably through innovations in equipment, materials and techniques. The introduction of the high-speed air turbine drill and use of panoramic X-ray equipment in the 1950s were two important advances which enabled the dentist to improve quality and productivity. The development of sealants to be placed over the pits and fissures is a more recent development that promises significant reduction in cavities during the vulnerable teenage years.

Anticipated Future Technological Advances

The emphasis in present research is shifting toward improving materials for restorative dentistry. Researchers are experimenting with more durable composite materials and with reducing exposure to radiation. The development of alternative precious metals and metal alloys promises to improve the quality of dental care and reduce the expense.

The most pronounced technological changes are likely to result from on-going immunochemical research. The most promising avenue of research is the development of an anti-cavity vaccine predicted to be in use by young children in the next decade. Other advances that may significantly affect the delivery of dental services include the use of lasers to weld restorative materials, the development of new materials and instruments for maxillofacial surgery, and transcutaneous electrical stimulation (TES).

It is predicted that the next two decades will not introduce technological advances as significant as those of the last two decades and general dental practice will likely center around preventive care and more widespread education of the patient to monitor his own dental health. Geriatric dental needs, in particular, will receive greater attention by the close of this century.

The emphasis in technological research will shift to the specialty areas. Ongoing research in the areas of endodontics (tooth pulp and root), periodontics (gum disease), and prosthodontics (artificial substitutes) will affect general dental practice and clinical procedures in all areas of specialization.

Current research in endodontics hopes to reduce cost and improve efficiency of dental health care by improving the technology for diagnostic testing. Improvement in treating root resorptions should also occur. An increase is expected in applied clinical studies as a result of interest in diagnostic tools to predict problems of the tooth pulp. It is hoped that clinical treatment will be improved through better diagnostic methods and delivery systems and greater emphasis on regeneration in periodontics. Patient control of plaque is increasingly important and more research is expected on fibronectin, osteonectin and citric acid and their role in promoting regeneration of periodontal support.

Major advances are occurring in the field of prosthodontics with the development of stronger, inexpensive and more durable restorative materials. These materials include new polymers and fillers to replace amalgam, physiochemical adhesion and biocompatible cements. Such innovations may create fillings which will withstand temperature changes, obtain stronger adhesive bonding to dentin, and improve the esthetics of the mouth.

Effects of Technological Advances on Dental Practice

Research efforts will have a significant impact on future dental practice. The following implications of recent technological advances were listed in the Report of the American Dental Association Special Committee on the Future of Dentistry:

(1) As the incidence of cavities among children continues to decrease, the need for restorative care will shift from children to adults. Therefore, the management of secondary cavities and root cavities will become increasingly important.

(2) Greater attention should be given to early intervention and prevention of root cavities. The use of remineralizing compounds and anti-bacterial agents could reduce these cavities.

(3) A reduction in complex restorations could result in fewer tooth fractures and a lower incidence of periodontal disease.

(4) As people retain more teeth, older adults will experience greater numbers of tooth fractures and will need more replacement restorations, more endodontic, periodontic and orthodontic care and more removable partial dentures.

(5) Dentists will devote more time and emphasis to the treatment of early and moderate stages of periodontal disease. General practitioners will begin to treat more periodontal conditions. Periodontal specialists will be required to treat complex cases of periodontal disease.

(6) The development of an anti-plaque agent could substantially reduce the prevalence of gingivitis (gum disease).

(7) Improved restorative and other dental materials will expand treatment options and modestly increase productivity. With improvements in materials, changes will be relatively inexpensive and easy to implement and some treatment options may become obsolete.

(8) Cavity preparations for composite restorations will require less cutting of tooth structure, reducing the discomfort to the patient.

(9) The demand for alternative materials and techniques will increase with continued requirements for the testing and monitoring of toxicity in materials.

(10) More emphasis will be placed upon defining the criteria for radiography in the diagnosis of dental disease and on improving

education in radiation biology and radiation protection. Alternatives to radiography will be developed.

(11) Increased use of new immunological, microbiological and sialochemical techniques is expected to enhance the dentist's ability to diagnose a wider range of oral disorders.

(12) Increased use of multi-disciplinary treatment teams is likely.

A review of medical literature reveals the significant impact of advancing dental technology on professional practice. Progress is most evident with the widespread reduction in cavities due to fluoridization of community water supplies. Technological change in the near future will not occur as rapidly as in the recent past. This projected decrease will be offset by increased emphasis on preventive care and more widespread patient awareness.

Prior advancements such as high-speed air turbine handpieces, panoramic X-ray equipment, pit and fissure sealants and analgesia devices have improved the quality of dental health care. Numerous advances were a result of financial support through the National Institute of Dental Research (NIDR), established in 1948. However, present economic conditions do not favor much increased biodental research.

As a result of new technology, postsecondary educational institutions must provide professional training and development for dental practitioners and disseminate oral health care information to the public. Dental schools have an increasing responsibility to provide "hands on" continuing education courses for practicing dentists and to design programs to increase public knowledge of dental disease.

IV. THE PRACTICE OF DENTISTRY

Introduction

Dentistry is the healing art involving the examination, diagnosis, treatment and care of conditions within the human mouth. Dentists are also responsible for the care of adjacent tissues and structures and they perform dental and oral surgery as well. Dentists take impressions of teeth or jaws and build and maintain prosthetic structures worn in the mouth.

Dental Practice

The largest percentage of active dentists are engaged in the private practice of dentistry on a full or part-time basis. A 1980 survey revealed that 71 percent of dental school graduates were located in a private practice one year after graduation. In 1982, approximately 82 percent of all dentists were general practitioners and 75 percent were practitioners in practice alone.

On the average, a dentist spends a little more than 40 hours a week on practice, three-fourths of which are devoted to treating patients. A solo dentist treats around 60 patients a week. The most prevalent form of payment has been fee-for-service. Also, traditionally, there has been an attempt to maintain an ongoing relationship between the doctor and the patient for ongoing care. While the majority of dental care continues to be delivered through the traditional fee-for-service form of private practice, some dentists have provided services to the public under a wide variety of practice patterns and financial arrangements and this diversity is expected to increase. Changes in the profession such as advertising, increased governmental intervention, consumer demands, the growth of dental benefit plans and the number of new graduates entering the workforce have caused dentists to attempt new practice patterns.

The Busyness of Dentists

Advances in technology and increased utilization of dental auxiliaries have allowed dentists to increase productivity by providing more dental services within a given time span. Thus, a recent concern of the dental profession has become a lack of "busyness" among dentists. An increasing percentage of dentists indicate that they would like more patients. For example, according to the American Dental Association in 1979, 25 percent of dentists stated they were not busy enough.

Alternate Practice Patterns

Due to competition and the perceived "busyness" problem, a trend towards group practice is developing. Growing numbers of dental school graduates are becoming associates in established practices prior to opening a solo practice. Another new practice pattern consists of two or more dentists who practice independently three or four days a week, sharing facilities. They employ their own staffs and utilize their own practice administration techniques. In such a practice, dentists can maintain a certain independence and practice in the traditional manner.

The alternative practice patterns listed below are estimated to comprise less than 2 percent of all dental services, but they are appearing with greater frequency.

1. Retail store dentistry, sometimes termed "shopping center dentistry" or "discount dentistry," has experienced increased growth in the last several years, principally in California and New York. This approach refers to dental services offered to the public within a retail department or drug store operation. Concern has been expressed over the establishment of good dentist and patient relationships and the provision of continuing, long-term dental care. Research in these areas is currently in progress but more needs to be done in order to address properly the issues being raised by both the profession and the public.

2. Individual Practice Associations (IPAs). A growing number of health care professionals, including some dentists, are affiliating with Individual Practice Associations as a way of responding to demands to moderate health care costs while preserving some of the freedom associated with traditional private practice.

   An Individual Practice Association (IPA) is a partnership or other legal entity organized and operated on behalf of health care providers, until now usually physicians. One of the IPA's primary functions is to enter into contractual agreements with health maintenance organizations (HMOs), unions, corporations, or other purchasers to provide health care benefits to an enrolled population for a fixed monthly premium.

3. Hospital Dentistry. During the past two decades, a rapid growth in the number and complexity of hospital dental services has occurred. Hospitals often serve as alternate delivery sites for special populations, such as the handicapped, poor and the elderly who are unable to visit a dental office. More and more dentists are using the hospital to provide dental treatment that cannot be safely provided in an office or when individuals have complicating medical problems that could be affected by dental treatment.

4. Health Maintenance Organizations (HMOs). Approximately one in five health maintenance organizations and HMO-like plans now offer comprehensive dental services. In 1979, 27 of 99 federally qualified HMOs and 21 of 115 prepaid health plans (HMO-like organizations without federal qualification) offered comprehensive dental services to subscribers on either a prepaid or fee-for-service basis, or approximately 1/20 of one percent of all U.S. dental practices.

5. Surgicenters. Surgicenters are a growing phenomenon because of the trend for outpatient surgery. Reasons given are that outpatient surgery costs 30 to 50 percent less. The majority of surgery is done with general anesthesia. Therefore such facilities will be used primarily by oral and maxillofacial surgeons and those general practitioners and specialists providing care to the handicapped.

6. Convalescent Centers and Nursing Homes. People need long term care when they have a chronic disease or condition which results in functional impairment and physical dependence on others. Nursing homes are the

primary setting for the impaired elderly and disabled who require institutionalization. Nearly all nursing home residents have multiple chronic conditions, averaging three per person. Mobility limitations caused by various disorders also are highly prevalent.

Dental Specialties

There are eight dental specialties recognized by the Council on Dental Education.

Dental Public Health
Endodontics
Oral Pathology
Oral and Maxillofacial Surgery
Orthodontics
Pedodontics
Periodontics
Prosthodontics

Historically, dental specialties were recognized for the purpose of assuring quality care in areas where general practitioners found it impossible, difficult, or inconvenient to provide specific services. Specialty areas required preparation beyond the level of most general practitioners.

The practice of dental specialties has changed dramatically since their original recognition. Distinctions between them are less obvious due to shifting demographic needs, the extension of the specialties as a result of expanded knowledge and procedures, and preventive dental measures that reduce the need for some types of treatment. Additionally, current dental graduates are prepared to undertake some procedures formerly performed exclusively by specialists. With the decrease in incidence of cavities, general practitioners will be devoting more time to such procedures.

While dentistry will remain primarily a profession of general practitioners, it is expected that the percentage and number of practicing specialists will increase. Competition for patients between general practitioners and specialists, among specialists, and between dentists and physicians will in all likelihood increase.

Licensure

Dental licensure is maintained at the state level. Several states have joined regional, clinical testing agencies which allow for a dentist's certification once the regional exam has been passed. Currently four such agencies exist:

1. Central Regional Dental Testing Service - 11 states represented
2. Northeast Regional Board - fourteen states and the District of Columbia represented.
3. Southern Regional Testing Agency - four states represented.
4. Western Regional Examining Board - four states represented.

There is some indication that certain member states in which there has occurred a rapid influx of new dentists may withdraw from their regional board.

A second means of providing geographic mobility for dentists is by reciprocal agreements between states. These agreements are receiving increased criticism because dentists licensed elsewhere are being judged by their state of residence rather than by competence. It is expected that the number of dentists licensed by reciprocal state agreements will decrease.

In place of regional board exams and reciprocal agreements, there is increasing use of licensing by credentials. It is expected that this trend will continue. The issue of licensing and its effects on dentist mobility presents a clearly defined controversy. Dentists geographically located so that they are experiencing a shortage of patients support a national reciprocity agreement. On the other hand, dentists in states experiencing rapid growth rates in their dental populations wish to maintain current policy.

In order to guarantee quality of care, a few states, since 1969, have enacted mandatory continuing dental education requirements for licensure. Nine ADA state societies have enacted membership requirements which involve continuing education. While continuing education may contribute to quality assurance, little documentation is available which suggests that it automatically leads to improvement of clinical competence. It is expected that efforts toward mandating continuing education will decrease. Florida has no continuing education requirements at present.

Florida Licensure

The Florida licensure procedure for dentists consists of successful completion of a three-part examination. There is a written portion which requires a passing score of 75 or better and the second part is a clinical exam which requires a general average of three or better. Both portions must be passed before receiving licensure, but if one is failed, only that one must be retaken. All examinations are conducted in English.

Applicants for examination or re-examination must have successfully completed the National Board of Dentists examination and received a National Board certificate within the past 10 years. No applicant will be permitted to take the exam without presentation of National Board scores and proof of dental school graduation. Applicants must be a graduate of a school accredited by the Commission on Accreditation of the American Dental Association or any other nationally recognized accrediting agency. Applicants graduating prior to the establishment of the Commission must have graduated from a dental school approved by the Florida Board of Dentistry.

Productivity in Providing Dental Services

Productivity has been identified as one factor affecting the supply of dental services. It is influenced by the variety and quantity of resources used. Productivity is enhanced by technological advances which affect dental equipment and the skills and methods of combining resources. Increased productivity of dentists can result in increased supply of dental services.

A 1979 ADA study did reveal some patterns. The highest annual rates of productivity increase occurred during the 1960's and the lowest rates during the 1970's. The same study suggests that while the rate of dentist productivity has generally increased, dentists could be working less time such that total

services rendered per dentist could be stable. There was a growing trend of annual visits per dentist between 1952 and 1978. Annual hours worked declined from 1958 to 1976 and then increased from 1976-1978. The increase in the rate of productivity has permitted the dentist a decrease in hours worked without a sacrifice in total patients treated.

It is expected that dental productivity will increase. Development of technology and expanded use of auxiliaries will continue to make it possible to provide dental services in less time.

Income for Dentists

According to a survey undertaken by the American Dental Association, the 1978 mean income of dentists was $48,000. Specialists incomes were 46 percent and 43 percent greater than the general practitioners. See Table 1. Based on reported incomes over the period 1959-1978, the average net income of all independent dentists increased 341 percent or an average of 5.9 percent per year. For the period of the 1970s, dentist real income showed a slight decline, with specialist income declining most rapidly. In 1979, dentists' income was in the top four percent of the nation. See Tables 2 and 3.

The economic forecasts for dental practice are related to the state of the national economy. Economists are offering mildly optimistic prospects for an improved economy in the next decade. Because the number of dentists will continue to grow faster than the population, it is expected that the average net income of dentists will show only moderate growth in the near future. This growth will be less than that of some other occupations.

This small growth in average dentist income in the near future and the increased costs of dental education are expected to discourage people from entering dental school. The result will be a slowing in the growth of the number of active dentists.

Due to a growth in demand, an improved economy, and a slowing in the growth in the supply of dentists, a higher rate of growth in dentist income could occur in the remainder of the century.

Applicants from Foreign Colleges or Schools

Dentists who have graduated from foreign dental colleges or schools not approved by the Board who wish to make application for licensure must complete a chronological order of mandatory procedures. They are:

1. Approval of credentials to take examination

2. Successful completion of the National Board of Dental Examiners Written Examination or National Board Equivalency Written Examiration

3. Successful completion of the mannequin examination administered by the Florida State Board of Dentistry.

The mannequin or manual skills exam is administered in two segments with a total of ten procedures.

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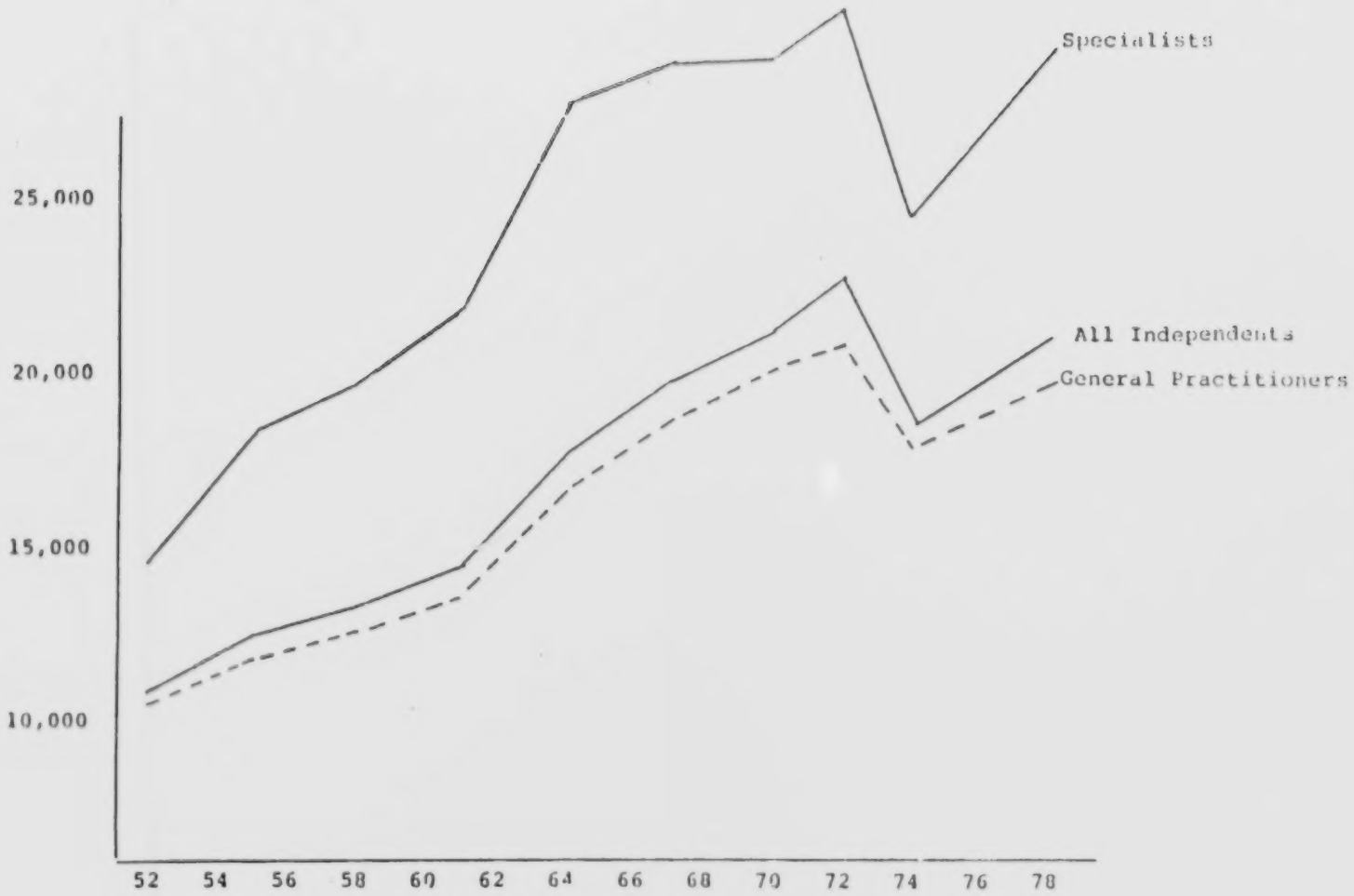
TABLE 1



Mean net incomes: all independent dentists, general practitioners, and specialists, 1952-1978 (nominal dollars and adjusted for inflation, CPI, 1952 = 100).

TABLE 2

Average annual growth rates (%) for average real net income of dentists and gross national product, selected periods, 1952-1978.

Period	All Independents	General Practitioners	Specialists	Gross National Product
1952-1978	2.6	2.5	2.6	3.6
1952-1964	4.1	3.8	5.3	3.9
1967-1978	0.6	0.6	0.1	2.9
1952-1958	3.2	2.8	4.8	3.0
1961-1967	5.5	5.5	4.7	5.3
1970-1978	-0.7	-0.4	-1.1	2.7

Source: American Dental Association, Surveys of Dental Practice, 1953-1979.

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TABLE 3

AVERAGE ANNUAL NET INCOMES OF SELECTED GROUPS
1978

GROUP	NET INCOME
Dentists	$48,363
Physicians	65,500
Top Level Attorneys	51,798
Chemists	47,156
Engineers	42,104
Chief Accountants	39,895
U. S. Family Median	17,640

Source: American Dental Association: Survey of Dental Practice, 1979

Continuing Education

Continuing education is expected to be increasingly necessary as the dental professions face changes in the populations they serve and changes in the types of services offered. It is estimated that over 4,000 organizations currently sponsor continuing dental education. Dental schools offered about 2,500 courses in 1980-81, a small portion of the estimated 100,000 courses available to dentists nationwide each year.

Advances in technology and changes in disease patterns as a result of better preventive measures and an aging population will require practicing dentists to reassess and perhaps update their professional practice. In particular, as general dentists increasingly treat conditions previously referred to specialists, practitioners will require increased clinical or technical training.

V. DENTAL EDUCATION

The training of dentists has been integrated into higher education since the nineteenth century. Of the 60 dental schools in the United States, 55 are under the aegis of a university or are a part of a university system. Four are associated with academic health centers unrelated to a parent university. One institution, Baylor College of Dentistry, operates as a completely autonomous entity.

Dental Schools by State

The 60 dental schools are located in 32 states and in Puerto Rico. Eighteen states have no dental schools. Of the ten largest states, all have at least one dental school. Sixteen states have more than one dental school. Of the ten largest states, California has five; New York and Illinois four; Texas and Massachusetts three; and Ohio, Michigan and New Jersey, two. Only two of the ten largest states have only one dental school: North Carolina and Florida. Of the southern states, one state has three schools (Texas) and three states have two schools (Georgia, Kentucky and Tennessee). The rest have one, except Arkansas, which has no dental school. See Table 4. Nationally, the 60 dental schools provide 5498 openings in their first-year class. In 1980, this equaled 2.69 slots per 100,000 population. Among the dental schools in the ten largest states, the mean number of slots is 2.53 per 100,000 population. Florida has the lowest ratio at 0.67. Among the Southern states having dental schools, the mean ratio is 2.52 per 100,000. Florida again has the lowest ratio at 0.67. See Tables 5 and 6.

Enrollment Levels

The health manpower legislation of the 1960s and 1970s is largely responsible for a considerable expansion in dental schools and dental school facilities. This legislation provided both capitation incentives for increased enrollment and construction awards to increase the capacity of institutions. Fourteen new schools have been established since 1960. Most of these new schools reached capacity by 1976. Since 1960, first-year enrollments have increased from 3,616 to 5,274. The number of graduates has increased from 3,101 to 5,756.

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TABLE 4

DENTAL SCHOOLS BY STATE

I. The Ten Largest States and Number of Dental Schools

State	Total Schools
California	5
Florida	1
Illinois	4
Massachusetts	3
Michigan	2
New Jersey	2
New York	4
North Carolina	1
Ohio	2
Texas	3

II. Southern States and the Number of Dental Schools

State	Total Schools
Alabama	1
Arkansas	0
Florida	1
Georgia	2
Kentucky	2
Louisiana	1
Maryland	1
Mississippi	1
North Carolina	1
South Carolina	1
Tennessee	2
Texas	3
Virginia	1
West Virginia	1

TABLE 4 (CONT.)

III. States Having No Dental School

Alaska	Nevada
Arizona	New Hampshire
Arkansas	New Mexico
Delaware	North Dakota
Hawaii	Rhode Island
Idaho	South Dakota
Kansas	Utah
Maine	Vermont
Montana	Wyoming

Source: ADA Annual Report on Dental Education, 1982-83.

TABLE 5

FIRST YEAR PUBLIC AND PRIVATE DENTAL ENROLLMENTS
AND RATE PER 100,000 POPULATION

TEN LARGEST STATES
1980

State	First-Year Enrollment	Enrollment Per 100,000 Population
California	586	2.47
Florida	66	.67
Illinois	489	4.28
Massachusetts	226	3.94
Michigan	235	2.54
New Jersey	178	2.41
New York	389	2.21
North Carolina	86	1.49
Ohio	260	2.41
Texas	415	2.90
MEAN	293	2.53

Source: Statistical Abstract of the U.S., 1982-83; American Dental Association, Supplement 11 to the Annual Report 1981-82 on Dental Education

TABLE 6

FIRST YEAR PUBLIC AND PRIVATE DENTAL ENROLLMENTS
AND RATE PER 100,000 POPULATION

SOUTHERN STATES
1980

State	First-Year Enrollment	Enrollment Per 100,000 Population
Alabama	72	1.85
Florida	66	.67
Georgia	168	3.06
Kentucky	146	3.99
Louisiana	101	2.39
Maryland	138	3.27
Mississippi	48	1.90
North Carolina	86	1.49
South Carolina	57	1.82
Tennessee	184	4.00
Texas	415	2.90
Virginia	113	2.11
West Virginia	64	3.28
MEAN	128	2.52

Source: Statistical Abstract of the U.S., 1982-83 and American Dental Association, Supplement 11 to the Annual Report 1981-82 on Dental Education

TABLE 7

Number of Schools, Full-Time Faculty and Enrollment, 1960-1983

	1960	1965	1970	1975	1980	1983
Number of Schools	47	49	53	59	60	60
First Year Enrollment	3,616	3,806	4,565	5,763	6,030	5,274
Total Enrollment	13,580	14,020	16,553	20,767	22,482	21,428
Graduates	3,101	3,110	3,775	4,969	5,256	5,756
Number of Full-Time Faculty	N/A	N/A	3,197	4,885	5,647	5,594

Source: Council on Dental Education, American Dental Association, 1984

Decline in Applicants

Since 1975, there has been a rather substantial decrease in applicants to dental school. In 1975, the total number of applicants to dental school was 14,900, with a ratio of applicants to accepted students of 2.59 to 1. The decrease in applicants began with the 1976-77 academic year and has progressed at a rate of approximately ten percent each year. For the 1980-81 academic year, the ratio was 1.49 to 1. Several causes have been identified for the decline: increase in tuition, better job opportunities in other fields, and better counseling by prehealth advisors.

The decline in applicants raises questions about the quality of the applicant pool. The distribution of science and general grade point averages, as well as DAT scores has remained relatively stable from 1976-1981. However, because the number of applicants has declined approximately 50 percent, dental schools have been forced to dip further down in this distribution. As a result, there has been a significant increase in the number of first-year dental students with GPA's below 3.0 and DAT scores below four. Because the population of 18-21 year olds is expected to decrease through the 1990s and because of the increasing cost of obtaining a dental education, it is anticipated that the applicant pool will decline even further.

Size of Schools

Total enrollment (excluding postdoctoral students) in the 60 U.S. schools ranges from a low of 72 at Harvard to a high of 647 at Ohio State University. The University of Florida College of Dentistry has an enrollment of 292. Twenty schools have an enrollment less than Florida's, 39 have a larger enrollment. See Table 8.

TABLE 8

Predoctoral enrollment in dental schools of the United States and Canada, 1982-83

Dental School	PRE-DOCTORAL STUDENTS										
	1st Year		2nd Year		3rd Year		4th Year		Total		
	Men	Women	Men	Women	Men	Women	Men	Women	Men	Women	Combined
University of Alabama	40	13	48	10	51	9	55	14	194	46	240
University of the Pacific	120	23	94	34	102	30	–	–	316	87	403
University of California at San Francisco	74	27	72	32	79	26	88	16	313	101	414
University of California at Los Angeles	70	26	74	31	75	31	70	36	289	124	413
University of Southern California	103	24	111	26	121	15	103	15	438	80	518
Loma Linda University	80	15	73	18	71	14	85	10	309	57	366
University of Colorado	20	7	16	10	17	8	18	7	71	32	103
University of Connecticut	28	22	22	12	39	10	35	8	124	52	176
Georgetown University	126	27	134	21	133	23	129	22	522	93	615
Howard University	73	30	68	33	65	36	78	28	284	127	411
University of Florida	70	11	62	16	53	20	47	13	232	60	292
Emory University	77	9	69	20	93	12	90	11	329	52	381
Medical College of Georgia	40	11	43	10	49	14	53	7	185	42	227
Loyola University	111	39	114	28	113	30	108	23	446	120	566
Northwestern University	91	24	97	21	92	19	97	15	377	79	456
Southern Illinois University	42	11	35	12	47	7	43	11	167	41	208
University of Illinois	103	33	98	25	129	26	136	28	466	112	578
Indiana University	92	22	87	28	99	20	101	23	379	93	472
University of Iowa	60	21	62	24	73	19	76	19	271	83	354
University of Kentucky	29	18	39	13	41	15	44	14	153	60	213
University of Louisville	49	17	63	15	51	18	59	15	222	65	287
Louisiana State University	59	16	72	16	77	15	85	9	293	56	349
University of Maryland	78	37	81	29	99	27	119	29	377	122	499
Harvard University	12	12	11	4	12	2	12	7	47	25	72
Boston University	68	25	37	14	38	10	35	11	178	60	238
Tufts University	120	38	122	31	131	29	—	—	373	98	471
University of Detroit	55	17	76	8	65	8	68	11	264	44	308
University of Michigan	96	39	106	40	106	35	124	27	434	141	575
University of Minnesota	100	34	119	20	109	26	117	25	445	105	550
University of Mississippi	35	11	41	4	38	5	32	6	146	25	171
University of Missouri at Kansas City	107	13	137	19	130	29	140	15	514	76	590
Washington University, St. Louis	65	17	68	17	75	10	85	15	273	59	332
Creighton University	73	8	63	11	67	11	60	10	263	40	303
University of Nebraska	49	7	51	11	55	8	59	7	214	33	247
Fairleigh Dickinson University	61	22	62	16	64	19	60	17	247	74	321
U. of Medicine and Dentistry of New Jersey	67	31	63	17	56	19	69	17	255	84	339
Columbia University	45	17	40	17	47	11	45	15	177	60	237
New York University	117	26	125	34	154	47	165	37	561	144	705
State University of New York at Stony Brook	14	13	18	7	18	8	23	4	73	32	105
State University of New York at Buffalo	77	12	74	18	69	17	69	12	289	59	348
University of North Carolina	65	17	60	16	66	14	55	17	246	64	310
Ohio State University	134	29	133	19	132	11	163	26	562	85	647
Case Western Reserve University	78	27	75	22	79	20	75	18	305	87	392
University of Oklahoma	60	11	54	12	48	12	52	9	214	44	258
Oral Roberts University	23	3	30	2	17	1	19	2	89	8	97
Oregon Health Sciences University	52	13	58	14	63	11	61	16	234	54	288
Temple University	115	22	97	31	127	20	126	19	465	92	557
University of Pennsylvania	94	31	118	46	139	34	105	40	456	151	607
University of Pittsburgh	96	17	83	22	88	17	85	17	352	73	425
Medical University of South Carolina	41	11	50	5	45	12	47	9	183	37	220
Meharry Medical College	26	23	28	14	28	22	15	11	97	70	167
University of Tennessee	87	14	110	14	97	13	141	12	435	53	488
Baylor College of Dentistry	92	27	111	28	118	23	117	19	438	97	535
University of Texas at Houston	92	30	81	42	86	29	102	24	361	125	486
University of Texas at San Antonio	101	27	115	28	113	27	109	20	438	102	540
Virginia Commonwealth University	75	31	84	23	80	25	92	16	331	95	426
University of Washington at Seattle	53	7	60	20	76	15	82	13	271	55	326
West Virginia University	39	13	39	9	44	13	51	9	173	44	217
Marquette University	110	28	112	25	105	21	118	16	445	90	535
University of Puerto Rico	48	17	39	27	42	23	44	21	173	88	261
Total by Sex	4,275	1,223	4,386	1,191	4,596	1,101	4,521	942	17,778	4,457	22,235
Total, United States	5,498		5,577		5,697		5,463		22,235		
University of Saskatchewan	3	18	9	13	5	18	10	34	27	83	110
University of Alberta	42	9	38	10	38	10	40	8	158	37	195
University of British Columbia	26	14	27	10	23	14	33	10	109	48	157
University of Manitoba	22	4	21	6	22	1	26	9	91	20	111
Dalhousie University	31	9	25	6	20	7	21	4	97	26	123
University of Toronto	95	25	95	23	96	25	103	20	389	93	482
University of Western Ontario	46	10	47	9	49	5	44	7	186	31	217
McGill University	32	8	29	13	25	11	31	8	117	38	155
Université de Montréal	44	41	57	28	53	24	54	26	208	119	327
University of Laval	27	8	27	9	18	6	14	8	86	31	117
Total by Sex	368	146	375	127	349	121	378	132	1,468	526	1,994
Total, Canada	514		502		470		508		1,994		

Source: ADA Council on Dental Education, 1983

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The Costs of Dental Education

The cost of dental education nationally has accelerated considerably during the last decade. In 1970, the average cost per student for dental education was on the average less than $10,000 per student per year and by 1980, the cost had risen to nearly $25,000. Public school expenditures per student are considerably higher than private schools. In the year 1980-81, expenditures per student reached $23,000 in public schools and $15,700 in private schools. Expenditures per student also vary by the size of the institution. In 1980-81, schools with enrollments of 250 or less spent nearly $26,700 per student compared with $19,200 for schools with 251 to 449 students and $16,200 for schools with more than 450 students.

TABLE 9

Cost Per Equivalent Undergraduate Dental Student
(Excluding Research)

	Type of School			Size of School		
FYE	All	Public	Private	Small Under 250	Medium 251-450	Large Over 450
1976	$14,622	na	na	na	na	na
1977	16,548	na	na	na	na	na
1978	17,502	na	na	na	na	na
1979	18,667	$21,616	$14,355	$24,676	$17,577	$14,984
1980	20,020	22,968	15,724	26,691	19,241	16,209

Source: ADA Special Committee on the Future of Dentistry, 1983

Federal and State Support

Along with the increase in costs, there have been shifts in the sources of support for dental education. As Table 10 indicates, the greatest change in the financing of dental education over the last decade has occurred in the relative proportion of revenues emanating from the federal and state governments. In 1971, the states provided 36.1 percent of all revenues. By 1980, this had increased to 46.8 percent, a thirty percent increase. The federal government's capitation dollars had decreased from 12.1 percent of all revenues to 4.0 percent of all revenues, a 70 percent decrease.

During the 1970s, dental schools received almost $300 million in general institutional support (capitation) under the federal Health Professional Education Act and more than $100 million in support for specific educational projects and programs. Because of this large infusion of federal monies,

TABLE 10

REVENUE SOURCES FOR DENTAL SCHOOLS

	Tuition	State	Capitation-Federal	Dental Clinic	Research	Total Revenue
1971	$ 41,128,559 (17.3)	$ 85,873,830 (36.1)	$ 28,802,048 (12.1)	$ 21,786,786 (9.2)	$ 18,969,416 (8.0)	$238,210,024
1974	$ 46,196,544 (17.1)	$ 99,707,431 (36.8)	$ 34,842,639 (12.9)	$ 27,509,551 (10.2)	$ 20,718,280 (7.7)	$270,705,334 ((13.6))
1975	$ 51,648,322 (16.6)	$117,582,178 (37.9)	$ 35,656,099 (11.5)	$ 32,193,197 (10.4)	$ 21,196,585 (6.8)	$310,387,763 ((12.1))
1976	$ 58,265,745 (16.8)	$142,735,269 (41.0)	$ 32,478,062 (9.3)	$ 38,655,779 (11.1)	$ 23,972,891 (6.9)	$347,804,062 ((13.6))
1977	$ 67,817,814 (17.2)	$175,927,201 (44.6)	$ 22,345,363 (5.7)	$ 43,989,275 (11.1)	$ 28,499,970 (6.7)	$294,937,836 ((10.1))
1978	$ 78,929,756 (17.9)	$205,994,701 (26.7)	$ 22,548,714 (5.1)	$ 47,588,323 (10.7)	$28,499,970 (6.5)	$441,074,962 ((11.6))
1979	$ 94,394,423 (19.3)	$225,762,646 (46.1)	$ 24,949,714 (5.1)	$ 57,979,842 (11.8)	$ 30,935,360 (6.3)	$489,932,226 ((11.0))
1980	$108,341,456 (20.0)	$253,432,542 (46.8)	$ 21,710,937 (4.0)	$ 63,499,530 (11.7)	$ 33,960,340 (6.3)	$541,413,388 ((10.5))

Source: American Dental Association; Special Report on the Future of Dentistry, 1983

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schools developed new programs and expanded existing ones, with subsequent increases in faculty and staff. They also became somewhat dependent on federal support to maintain programs, remain competitive, contain tuition charges and avoid dependence on clinic income. Since 1979-80, all federal institutional support has ceased.

The amount of federal versus state support varies, of course, between public and private schools. In 1980, for public schools, the mean amount of state revenue per student was $15,321 which represented 64.5 percent of their total revenue. The range was 41.4 percent to 87.8 percent.

The decrease in the funds for research from 8.0 percent to 6.3 percent is also indicative of the decline in federal support since most research is federally funded. The increase in tuition from 17.3 percent to 20.0 percent of total revenues and the increase in revenues from the dental clinics from 9.2 percent to 11.7 percent represent attempts on the part of dental schools to recoup funds no longer available from the federal government.

Tuition Income

Tuition rates have increased over the last decade. In private schools, tuition rose from 30 percent of total revenue in 1974-75 to 42 percent in 1979-80. Increases were considerably less significant in public schools, from 8 percent to 9 percent.

TABLE 11

Tuition income as percentage of total school revenue

	1974-75	1979-80
All	16.6	22.2
Private	30.7	41.5
Public	7.9	9.3

Source: Council on Dental Education, American Dental Association

Clinic Income

Patient services represent an additional source of revenue for dental schools. Income from patient services rose only slightly during the 1970s from 10.4 percent in 1974-75 to 12.2 percent in 1979-80.

TABLE 12

Clinic income as percentage of total school revenue	1974-75	1979-80
All	10.4	12.2
Private	14.7	15.8
Public	7.7	10.1

Source: Council on Dental Education, American Dental Association

Employment of Full-time and Part-time Faculty

During the 1970's, the number of full-time instructors increased from 34 percent to 44 percent of the entire faculty in dental schools. The availability of federal monies, the operation of a great many new and expanded facilities, the initiation of new programs and the increased enrollment of existing programs added greatly to this increase.

However, other factors contributed as well. Some areas, such as the behavioral sciences, are less amenable to part-time employment. More students completed postdoctoral programs and sought full-time careers in dental education and research, providing a larger pool of potential full-time faculty members. Curriculum changes, changes in the mix of students and an increased emphasis on scholarly activities also added to the increase in the number of full-time positions.

In an effort to reduce costs, schools may reassess their current faculty-to-student ratios, and may institute hiring practices to employ more part-time than full-time instructors. More efficient utilization of faculty, staff, facilities and supplies could contribute to lowered costs.

According to the American Dental Association "the financial position of the country's dental schools have weakened considerably." The ADA has summarized what it considers may be the implications of the weakening financial situation:

- The continued operation of a program will probably depend upon its ability to attract additional revenue, to control expenditures, to muster political support, to meet manpower needs of its state or region and to remain financially solvent in an atmosphere of declining resources, higher costs and changing priorities.
- Some schools quite possibly will be unable to achieve this kind of financial stability and will close.
- In some cases, universities may decide to phase out some portion of the dental education program rather than to terminate it all.
- School closures will result in fewer graduates, loss of faculty positions and a loss of a valuable community resource.
- Schools will continue to be highly vulnerable to changes in the economy.
- Severe economic constraints may seriously affect the quality of dental education.

Cost Savings Through Reduced Enrollments

Over the last few years, a number of states have reduced enrollments at dental schools or advisory boards have recommended reductions. It is anticipated that there will be additional reduction in dental school enrollments now that the federal capitation money is no longer available, particularly in private schools.

It is generally recognized that in schools that have or are considering decreasing enrollment by relatively small numbers (five to ten students) the per student cost of education will increase. The impact will be greatest for the private schools which are dependent to a significant degree on tuition and clinical income. The reason for the increased per student cost is because many fixed costs remain constant despite the fact that there are fewer students, such as the operation of facilities, heat, lighting and air conditioning. Small cuts in enrollment have little or no appreciable effect on reducing the number of faculty required for instruction. For example, there would be no reduction in faculty required for instruction. Some faculty cost savings may be achieved in the laboratories or clinics because a lower number of faculty would be required to maintain faculty to student ratios.

The ADA states that in order for an educational institution to realize cost benefits through decreased enrollment, such decreases in enrollment would probably have to be in the magnitude of a 20 to 25 percent decrease. Most of the cost savings would be in the categories of faculty and support personnel. However, other fixed costs related to operating the physical facilities would not be reduced substantially, if at all, and, therefore, would also ultimately result in an increased cost of education per student.

Tuition Costs and Student Indebtedness

For the 1980-81 academic year, the average resident tuition and fee cost for public dental schools was $2,315 while that for private schools was $7,578. This is a dramatic increase over the past 10 years, 252 percent for public schools and 266 percent for private schools. If the first year costs for the instruments, textbooks, health service and others are added, the average cost for public dental schools would increase to $5,231 while that for private schools would be $10,717.

TABLE 13

Average Cost of Resident First Year Tuition and Fees

	1970	1973	1975	1976	1977	1978	1979	1980
Public	$ 657	$ 858	$1,344	$1,638	$1,812	$1,957	$2,150	$2,315
Private	2,027	2,618	3,436	4,040	4,782	5,584	6,481	7,578
Total	1,263	1,599	2,195	2,615	3,020	3,468	3,955	4,624

Source: Council on Dental Education, American Dental Association

Over the four year period of undergraduate education this total cost for public dental schools would be $15,581 while for private dental schools it would be $35,902. These figures do not include living expenses (room, board, and other incidentals) which must be added in order to obtain a complete picture of the cost to the student for financing his dental education.

Much discussion has occurred recently over proposals to increase tuition even higher than in the past. The State of Colorado pioneered a full-cost tuition program where out-of-state students were charged the full cost of the education. In 1981-82, that represented $22,754 a year. The tuition could be waived in exchange for agreeing to establish practice in underserved areas of Colorado. Officials in Colorado have not been satisfied with the program, however, because the number of out-of-state students applying to the school has dropped and because many of those who initially agreed to practice in areas of need have opted to buy out of the agreement and establish practice elsewhere.

In less than four years, the mean indebtedness upon graduation from dental school has increased 54 percent, from $16,000 to $24,650 between 1978 and 1981. Indebtedness for students graduating from public schools reached $17,000 in 1981; in state-related schools, it reached $24,300 and $29,800 in private schools. These increases are directly related to tuition increases.

With regard to ethnic designation, blacks entered dental schools with the highest mean indebtedness, but incurred the least amount of debt during their dental education. The mean total indebtedness on graduation ranged from a low of $17,930 for Caucasian whites, to a high of $25,710 for American Indians and Alaskan natives.

With regard to type of practice, those entering governmental service had the least amount of debt, $14,410; the highest was for those planning to enter an advanced education program. The indebtedness of those who planned to be self-employed was substantially less than for those who were to be employed by others. Indebtedness was the major factor in the choice of type of practice for 27 percent of the graduates, a factor equal to other factors for another 30 percent, and no factor in choice for 43 percent.

Over 80 percent of dental students depend on loans to finance their professional education. In the late 1950s, the federal government developed a variety of loan programs to help students obtain an education in health care. In 1981, over 70 percent of the graduating class obtained student loans, one third obtained National Direct Student Loans and 17 percent obtained Federal Health Assistance Loans.

The federal policy toward health professions students is changing. Because the government believes that the income potential of these students is quite high, it feels that they should take responsibility for more of the cost of their education. Therefore, for its new programs, such as Health Education Assistance Loans, the government has raised interest rates to prime and required compounding to commence with receipt of the funds not six to 12 months after graduation. According to the American Dental Association, the net effect of this new policy will be to double the indebtedness levels of the average graduating dental student. Examples of typical student debt loads for various loan programs are included in Table 14.

TABLE 14

STUDENT INDEBTEDNESS 1978-81

Student indebtedness 1978-81

	1978	1979	1980	1981
1. Indebtedness				
Mean Entering Debt	$1,600	$1,600	$1,600	$1,600
Mean Graduating Debt of those with Debt	16,000	18,750	20,800	24,650
% of Seniors with Debt $20,000	25.9%	33.5%	43.4%	56.1%
2. Percent with Loans				
Federal Health Professions Loan	43.5%	39.9%	45.1%	37.7%
National Direct Student Loans (NDSL)	19.7	23.4	25.9	33.9
Guaranteed Student Loan (GSLP)	54.5	47.4	64.0	71.1
HEAL Loan	n/a	5.8	9.4	16.5
Personal Bank Loan	13.9	12.5	10.7	9.6
Family and Other Loans	40.7	n/a	67.8	61.1

Source: Adapted from Eric Solomon, "Trends in Dental Graduates' Indebtedness" *J. Dent. Ed.* 3, p. 188, 1982

Estimated indebtedness allowed by each program

Program	Years of schooling				Total borrowed
	1	2	3	4	
HEAL	$10,000	$10,000	$10,000	$10,000	$40,000
GSLP	5,000	5,000	5,000	5,000	20,000
HPSL*	7,500	7,500	7,500	7,500	30,000
NDSL	3,000	3,000	3,000	3,000	12,000

*Tuition estimated at $5,000

Source: Adapted from *Analysis of Federal Programs Which May Provide Financial Aid to Dental Students*, U.S. Dept. of Health & Human Services, March 1981, pp. 10-12

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Curriculum

Dental programs have traditionally been four years in length. In the early 1970's, influenced by a Carnegie Commission report and the 1971 federal Health Manpower Act, 16 schools offered a three-year curriculum. However, by 1981 all the dental schools except one reverted to the traditional four-year program. A variety of reasons were cited, chief among them being discontinuation of federal incentives, pressures on faculty and students, lack of time for remediation of students, lack of time for research and scholarly development of faculty, and lack of time for reflection and for development of student's clinical confidence. In 1979, Harvard even implemented a five-year curriculum. However, there does not appear at this time to be a national concensus for five-year programs. The ADA has expressed the view that the educational sequence should not be extended to five years. However, dental programs are lengthening. In 1975, the average dental program was 142.3 weeks. By 1980, the average had increased to 152.1 weeks. This ten week increase is equivalent to adding an additional quarter to the average program. Table 15 lists the number of weeks of dental programs for the different schools for 1982-83. The University of Florida dental school has a 180-week curriculum. Only two other schools have longer programs, Meharry Medical College at 192 and Harvard University at 221.

Two-plus-four programs (two years of college and four years of dental school) exist in theory at most schools, but are rarely utilized. In these programs, the student may earn a baccalaureate degree upon completion of the second year of dental school. Such programs allow the student to graduate earlier and with less debt. On the other hand, such programs might graduate inexperienced students who are less broadly prepared for a dental career.

The dental curriculum has been structured to prepare graduates for general practice without additional formal education. Theoretical and practical knowledge is provided in the biological, clinical, behavioral and social sciences as well as in the scientific method. Clinical practice in a wide range of services is provided for the student to gain experience in providing comprehensive care for patients and to assume ultimate responsibility for the total oral health care of patients. Dental school faculty and alumni typically develop curricula based on their assessment of the skills necessary to practice dentistry. Because dentistry's knowledge base is expanding and because new learning theories are being explored, curricula changes are common.

A recent study by the American Dental Association suggested that "curricula changes should reflect changing patterns of dental disease, technological advances, and demographic shifts in the population."

The report also mentioned concern over an increasingly overcrowded curricula, resulting in part from the knowledge explosion and made more serious by inadequate basic skills among some students. Caution was urged in responding to pressure from external groups such as licensing boards and groups representing special populations. Careful decisions must be made over which areas need to be added to the standard curriculum and which may be adequately addressed in continuing education or postdoctoral training.

The study made specific note of the increasing responsibilities of dentists for preventive care and noted that though there has been increased discussion of the role of preventive care, the faculty and curriculum have been slow to reflect

TABLE 15

Description of academic programs in dental schools in the United States and Canada, 1982-83

Dental School	Type of Term	Length of Term (wks.)	Length of Academic Year (wks.)	Total Length of Program (wks.)	Type of Program +	Type of Degree Granted	Type of Institutional Support
University of Alabama	Quarter	13	34-41	152	4-4	D.M.D.	Public
University of the Pacific	Quarter	11	44-44	132	4-3	D.D.S.	Private
University of California at San Francisco	Quarter	11	33-39	144	4-4	D.D.S.	Public
University of California at Los Angeles	Quarter	11	34-42	152	4-4*	D.D.S.	Public
University of Southern California	Trimester	15	30-45	165	4-4*	D.D.S.	Private
Loma Linda University	Quarter	11	33-41	156	4-4	D.D.S.	Private
University of Colorado	Semester	18	36-46	174	4-4	D.D.S.	Public
University of Connecticut	Other	40	38-44	162	4-4	D.M.D.	Public
Georgetown University	Semester	16	32-44	152	4-4	D.D.S.	Private
Howard University	Semester	16	32-42	158	4-4	D.D.S.	Private
University of Florida	Semester	15	45-45	180	4-4*	D.M.D.	Public
Emory University	Quarter	10	32-44	152	4-4	D.D.S.	Private
Medical College of Georgia	Quarter	12	33-44	157	4-4	D.M.D.	Public
Loyola University	Quarter	11	33-33	132	4-4	D.D.S.	Private-State Related
Northwestern University	Quarter	11	35-46	173	4-4*	D.D.S.	Private-State Related
Southern Illinois University	Semester	18	37-43	158	4-4*	D.M.D.	Public
University of Illinois	Quarter	12	36-36	144	4-4	D.D.S.	Public
Indiana University	Semester	16	32-42	158	4-4	D.D.S.	Public
University of Iowa	Semester	16	36-38	150	4-4*	D.D.S.	Public
University of Kentucky	Semester	18	37-45	156	4-4	D.M.D.	Public
University of Louisville	Semester	18	36-44	160	4-4*	D.M.D.	Public
Louisiana State University	Other	44	39-44	171	4-4	D.D.S.	Public
University of Maryland	Semester	16	36-45	156	4-4*	D.D.S.	Public
Harvard University	Semester	18	37-46	221	5-5	D.M.D.	Private
Boston University	Semester	16	33-45	155	4-4	D.M.D.	Private
Tufts University	Trimester	15	30-45	155	4-4	D.M.D.	Private
University of Detroit	Semester	17	34-45	158	4-4	D.D.S.	Private-State Related
University of Michigan	Semester	16	32-44	140	4-4	D.D.S.	Public
University of Minnesota	Quarter	11	34-40	142	4-4	D.D.S.	Public
University of Mississippi	Quarter	12	36-45	157	4-4	D.M.D.	Public
University of Missouri at Kansas City	Trimester	15	31-46	169	4-4	D.D.S.	Public
Washington University, St. Louis	Semester	19	38-44	165	4-4	D.M.D.	Private
Creighton University	Semester	17	34-44	156	4-4	D.D.S.	Private
University of Nebraska	Semester	17	33-42	151	4-4	D.D.S.	Public
Fairleigh Dickinson University	Semester	17	34-41	150	4-4*	D.M.D.	Private-State Related
U. of Medicine and Dentistry of New Jersey	Semester	17	34-42	144	4-4	D.M.D.	Public
Columbia University	Other	12	32-42	150	4-4*	D.D.S.	Private-State Related
New York University	Other	34	34-42	152	4-4	D.D.S.	Private-State Related
State University of New York at Stony Brook	Semester	20	38-40	158	4-4	D.D.S.	Public
State University of New York at Buffalo	Semester	18	36-42	152	4-4*	D.D.S.	Public
University of North Carolina	Semester	15	30-38	141	4-4*	D.D.S.	Public
Ohio State University	Quarter	11	33-44	154	4-4	D.D.S.	Public
Case Western Reserve University	Semester	18	36-44	160	4-4	D.D.S.	Private-State Related
University of Oklahoma	Semester	18	36-44	152	4-4	D.D.S.	Public
Oral Roberts University	Semester	16	32-40	144	4-4	D.M.D.	Private
Oregon Health Sciences University	Quarter	12	35-36	143	4-4	D.M.D.	Public
Temple University	Semester	16	32-45	154	4-4	D.D.S.	Private-State Related
University of Pennsylvania	Semester	18	36-44	160	4-4*	D.M.D.	Private
University of Pittsburgh	Trimester	15	40-47	175	4-4*	D.M.D.	Private-State Related
Medical University of South Carolina	Semester	15	33-40	153	4-4*	D.M.D.	Public
Meharry Medical College	Semester	17	48-48	192	4-4	D.D.S.	Private
University of Tennessee	Other	10	34-34	136	4-4	D.D.S.	Public
Baylor College of Dentistry	Quarter	12	36-44	160	4-4	D.D.S.	Private-State Related
University of Texas at Houston	Quarter	11	40-40	160	4-4*	D.D.S.	Public
University of Texas at San Antonio	Semester	19	38-42	160	4-4*	D.D.S.	Public
Virginia Commonwealth University	Semester	17	35-38	146	4-4	D.D.S.	Public
University of Washington at Seattle	Quarter	11	33-43	175	4-4	D.D.S.	Public
West Virginia University	Semester	16	40-40	160	4-4*	D.D.S.	Public
Marquette University	Semester	16	33-41	148	4-4	D.D.S.	Private-State Related
University of Puerto Rico	Trimester	12	36-40	156	4-4	D.M.D.	Public
University of Saskatchewan	Semester	14	26-32	146	5-5	D.M.D.	Public
University of Alberta	Semester	15	30-30	120	4-4	D.D.S.	Public
University of British Columbia	Other	15	27-31	116	4-4	D.M.D.	Public
University of Manitoba	Semester	17	34-34	136	4-4	D.M.D.	Public
Dalhousie University	Semester	17	29-34	131	4-4	D.D.S.	Private-State Related
University of Toronto	Semester	15	24-36	118	4-4	D.D.S.	Public
University of Western Ontario	Quarter	9	32-33	129	4-4	D.D.S.	Public
McGill University	Other	—	33-38	141	4-4	D.D.S.	Private-State Related
Université de Montréal	Semester	15	30-30	120	4-4	D.M.D.	Public
University of Laval	Semester	15	30-35	135	4-4	D.M.D.	Public

+ 4-4 4 Academic Year—4 Calendar Year
4-3 4 Academic Year—3 Calendar Year
5-5 5 Academic Year—5 Calendar Year
* Student can complete program in less time.

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the concern. Faculty are generally more interested in treatment than prevention. However, in the future, dentists will increasingly be responsible for motivating patients to take care of their own teeth. This orientation is in conflict with traditional dental education, will be difficult to change and will demand modifications in the curricula.

Graduates of Foreign Dental Schools

The number of people who have graduated from foreign dental schools and present themselves for licensure in the United States has grown considerably over the last decade. At present fourteen states including Florida and the District of Columbia accept foreign graduates as candidates for licensure without requiring them to take enough coursework at a U.S. dental school to obtain a U.S. degree.

The following table indicates that in 1970 only 17 foreign dental graduates applied for licensure in the U.S. Of these, eight passed while nine failed (52.9 percent). In 1979, the most recent year for which data are available, 927 foreign dentists applied for licensure. Of these, 681 or 73.5 percent failed to receive licensure. The failure rate of foreign dentists has remained relatively stable since 1976 at between 71 to 75 percent. This failure rate is relatively high when compared to that for American trained prior graduates, which in 1970 was 19.7 percent.

TABLE 16

Licenses Awarded to Dentists Trained In Foreign Dental Schools

		1970	1975	1976	1977	1978	1979
Recent Graduates	Passed	2	0	1	1	15	9
	Failed		0	1	1	3	1
Prior Graduates	Passed	6	259	222	300	256	236
	Failed	9	194	554	798	816	681
Percentage of Failure		52.9	42.8	71.4	72.5	74.9	73.5

Source: Council on Dental Education, American Dental Association, 1983

In Florida, over 100 foreign graduates per year have been standing for the state licensure exam. The pass rate has varied between 27 percent and 55 percent for the last three administrations.

TABLE 17

Passing Rates of Graduates of Foreign Dental Schools

EXAMINATION DATE	PASS NO.	PASS %	FAIL NO.	FAIL %	TOTAL
June 1982	22	30.6%	50	69.4%	72
December 1982	12	26.7%	33	73.3%	45
June 1983	33	55.0%	27	45.0%	60

Source: Florida Board of Dentistry, Department of Professional Regulation, 1983

VI. THE SUPPLY OF AND DEMAND FOR DENTISTS IN FLORIDA

Demand for Dental Care

Demand for dental care is significantly different from need for dental care. Though need is almost universal, demand is much more selective. As shown in Table 18 only about one-half of the population visits a dentist once a year. The frequency varies by a number of factors. Income is one of the most important determinants. About 60 percent of people in families with high incomes visit a dentist annually, as compared with about 30 percent in low income families. Education is equally significant. In families where the head of the household has eight or less years of education, only 28 percent of the members visit a dentist once a year. In families with postsecondary education, the percentage jumps to 64 percent. The percentage also varies by region. Only 40 percent of the people in the South visit a dentist once a year. The comparable figure is 57 percent in the Northeast, 52 for the North Central and 50 for the West. By age, the percentage is highest for teenagers (62 percent) and lowest for young children (24 percent). About one-half of the young and middle-aged adults visit a dentist yearly. The number goes down to 33 percent for the elderly. With regard to race, utilization by whites exceeds that of nonwhites (51 percent as compared to 35 percent). It is as low as 14 percent for poor blacks in the rural South. Two other factors that influence demand are the prevalence of dental benefit plans and governmental subsidies for dental services.

The impact that changes in these characteristics will have on demand for dental services in the future cannot be precisely forecasted. However, one can make some general comments. The aging of the U.S. population and of Florida's population specifically will affect both overall demand and the type of services being sought. If the economic condition of the country and of Florida strengthens, an increasingly larger percentage of the general population will seek medical care. If the educational level continues to rise, one would expect an increase in demand. Total demand for dental services should continue to grow as the population in Florida increases in size. By the year 1990, it is predicted that Florida will be the fourth largest state. Demand should also increase as the population moves into age groups historically reflecting higher rates of utilization. As a larger percentage of adults retain their teeth into old age, demand for preventive, restorative, periodontic, endodontic and fixed prosthetic services could increase, while demand for extractions and removable prostheses could decrease. The number of people covered by dental insurance benefits is around 90 million and the ADA predicts that the number will reach 100 million by 1985. However, future growth is expected to be slow. Governmental subsidies are declining. In 1980, public expenditure for dental care amounted to $600 million. In 1974 forty-one states offered some type of adult dental benefits in the Medicaid program. By 1981, the coverage had dropped to 30 states. Florida offers coverage for adults and children and paid around $4 million dollars for 8,000 adults and 60,000 children to receive services in 1979. If the pattern of in-migration of northerners to Florida continues, dental utilization may increase as northerners have traditionally sought dental care with greater frequency than southerners. Any of these trends, however, may be countered by advances in technology that could improve preventive oral health strategies thus decreasing demand.

TABLE 18

PERCENT SEEING A DENTIST BY
SELECTED POPULATION CHARACTERISTICS
1976

CHARACTERISTICS	PERCENT
Age	
1-5 years	24%
6-17	62%
18-34	52%
35-54	48%
55-64	45%
65 years or more	33%
Sex	
Male	46%
Female	51%
Residence	
SMSA - Urban	52%
Non-SMSA-Urban	44%
Rural	44%
Region	
Northeast	57%
North Central	52%
South	40%
West	50%
Family Income	
Low	33%
Medium	47%
High	61%
Education of Head	
8 years or less	28%
9-11	40%

TABLE 18 (Continued)

CHARACTERISTICS	PERCENT
12	50%
13 years or more	64%
Race	
Whites	51%
Non-Whites	35%
Total	49%

Source: Division of Health Interview Statistics, National Center for Health Statistics; Data from the Health Interview Survey

The Florida Occupational Information Coordinating System has developed employment projections for the period from 1980-1990. For dentists, they project the number of openings per year to be 244. However, the 1980 employment figures on which the projection is based are quite conservative at 2,680. The Department of Professional Regulation shows over 5,000 dentists in Florida in 1980.

TABLE 19

OCCUPATIONAL EMPLOYMENT PROJECTIONS TO
1990 AND AVERAGE
ANNUAL JOB OPENINGS FOR 1980-1990

	1980 Employment	1990 Employment	% Change	Average Openings Per Year
Dentists	2,680	4,670	74	244

Source: Florida Occupational Information Coordinating System, 1983

Supply of Dentists in Florida

Approximately 5,500 persons hold active licenses to practice dentistry in Florida. This represents about one dentist for almost every 2000 Florida residents or about 51.3 dentists for every 100,000 people. See Table 20. About 2000 of these dentists reside out-of-state.

The latest year for which data are available comparing Florida with other states is 1980. According to the U.S. Statistical Abstract, in 1980, the United States had 54.9 dentists per 100,000 population and Florida had 48.0. Compared to other southern states, only three states had a higher ratio. Virginia and Tennessee were slightly higher at 49.0 and 49.7 respectively. Maryland was considerably higher at 57.8. Alabama, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Texas and West Virginia all have lower ratios. Mississippi is the lowest at 32.6 dentists per 100,000 population. See Table 21.

Of the ten largest states, North Carolina at 38.6 and Texas at 44.7 have smaller ratios than Florida at 48.0. New York, Massachusetts, New Jersey and California have the highest ratios at 71.6, 68.2, 64.9 and 64.7 respectively. The ratios of the other three States range between 55.2 (Illinois) and 49.6 (Ohio). See Table 22.

Dentists by Region in Florida

The distribution of dentists by region in Florida varies considerably from the north to the south. In the Panhandle, the ratio of dentists per 100,000 people is 39.7; in the South it is 60.7. The ratios in the other three areas range

TABLE 20

ACTIVE DENTISTS IN FLORIDA
AND RATE PER 100,000
POPULATION
1960-1983

YEAR	NO. OF ACTIVE DENTISTS	RATE PER 100,000 POPULATION
1960	1,484[a]	29.9
1965	2,333	40.3
1970	2,805	41.3
1976	3,946	45.1
1977	4,215	47.2
1978	4,958[b]	54.1
1979	4,323	45.7
1980	5,462	56.0
1981	5,000	49.5
1982	5,029	48.4
1983	5,438	51.3

a Derived from total licensed dentists. In-state percentage calculated from the average in-state/out-of-state ratios in 1963, 1964 and 1965.

b Some uncertainty about these figures.

Source: Bureau of Economic and Business Research, University of Florida and **Department of Health and Rehabilitative Services, Office of Health Planning, 1984.**

TABLE 21

ACTIVE DENTISTS
AND NUMBER PER 100,000 POPULATION
SOUTHERN STATES

STATE	TOTAL DENTISTS, 1980	DENTISTS PER 100,000 POPULATION
Alabama	1,380	36.7
Florida	4,578	48.0
Georgia	2,142	40.7
Kentucky	1,584	44.9
Louisiana	1,669	42.7
Maryland	2,500	57.8
Mississippi	786	32.6
North Carolina	2,203	38.6
South Carolina	1,086	36.6
Tennessee	2,164	49.7
Texas	5,848	44.7
Virginia	2,549	49.0
West Virginia	753	40.7
United States	121,240	54.9

Source: U.S. Statistical Abstract, 1982-83

TABLE 22

ACTIVE DENTISTS -1980
AND NUMBER PER 100,000 POPULATION

TEN LARGEST STATES

STATE	TOTAL DENTISTS, 1980	DENTISTS PER 100,000 POPULATION
North Carolina	2,203	38.6
Texas	5,848	44.7
Florida	4,578	48.0
California	14,346	64.7
Illinois	6,214	55.2
Massachusetts	4,079	68.2
Michigan	5,085	54.7
New Jersey	4,860	64.9
New York	12,841	71.6
Ohio	5,337	49.6
United States	121,240	54.9

Source: U.S. Statistical Abstract, 1982-83

between 44.9 and 48.3. The ratios are correlated with family income which is common throughout the country. See Table 23.

Distribution by County

At the county level, there is considerable variance in the dentist-to-population ratio. The county is a somewhat awkward entity to use to estimate adequacy of dental manpower as commuting patterns do not necessarily correlate with county lines. However, in some circumstances county data clearly indicate inadequate supply. For example, though the state ratio is one dentist for almost 2000 people, small counties such as Baker, De Soto, and Osceola have a ratio of about 1 to 5000. Over twenty counties in Florida have more than 4,000 people for every one dentist. Three counties, Gilchrist, Glades, and Jackson, have no dentists. The severity of the problem differs significantly among counties, however, because in some counties residents are able to seek service in neighboring counties. See Table 24.

The federal Department of Health and Human Services attempts to locate areas of the country where health manpower shortages occur. Table 25 provides a listing of the areas in Florida designated dental shortage areas.

TABLE 25

Florida HMSA Designations Since June 15, 1982

County of Designation	Type of Designation	Population/Area Designated	Date Designated
Dade	Dental	CT 113 & CT 174	Dec. 29, 1982
Leon & Wakulla	Dental	Poverty	Jun. 16, 1982
Okaloosa	Dental	Low Income	Jun. 28, 1982
Columbia	Dental	Entire County	Jul. 19, 1982
Union	Dental	Entire County	Jul. 19, 1982
Hendry & Glades	Dental	De-designated	Feb. 1983

In-Migration of Dentists

The majority of dentists in Florida who sit for the exam and who pass the exam are from out-of-state. Table 26 shows the number of dentists who successfully completed the Florida boards between 1979 and 1983. More than half are from out-of-state (56.5 percent). Simarily, approximately 30 percent of the dentists holding Florida licenses are from out-of-state. These people may enter and practice in Florida at any time. Most studies have shown that dentistry as a

TABLE 23

THE NUMBER OF DENTISTS
BY REGION IN FLORIDA
1983

REGION	ACTIVE DENTISTS	DENTISTS PER 100,000 POPULATION
Panhandle	343	39.7
Crown	621	46.8
East Central	769	48.3
West Central	1,259	44.9
South	2,241	60.7

Source: Florida Dental Association 1983 and "Projections of Florida Population by County: 1985-2020," Bulletin No. 65, June 1983, Bureau of Economic and Business Research, University of Florida

TABLE 24

POPULATION PER DENTIST
FLORIDA COUNTIES
1983

County	Population Per Dentist	County	Population Per Dentist	County	Population Per Dentist
Alachua	942	Hamilton	4,382	Okaloosa	2,547
Baker	5,360	Hardee	6,656	Okeechobee	4,487
Bay	2,487	Hendry	2,902	Orange	1,671
Bradford	2,956	Hernando	3,784	Osceola	4,932
Brevard	2,014	Highlands	2,739	Palm Beach	1,453
Broward	1,595	Hillsborough	2,172	Pasco	3,923
Calhoun	2,317	Holmes	3,064	Pinellas	1,880
Charlotte	2,291	Indian River	1,912	Polk	3,109
Citrus	3,461	Jackson	3,605	Putnam	4,408
Clay	1,896	Jefferson	3,664	St. Johns	2,855
Collier	1,635	Lafayette	4,076	St. Lucie	3,257
Columbia	4,111	Lake	2,374	Santa Rosa	4,186
Dade	1,722	Lee	2,104	Sarasota	1,573
De Soto	5,038	Leon	1,773	Seminole	2,380
Dixie	8,792	Levy	3,588	Sumter	12,647
Duval	2,159	Liberty	4,353	Suwannee	7,961
Escambia	2,232	Madison	3,763	Taylor	5,717
Flagler	2,592	Manatee	2,338	Union	2,827
Franklin	7,894	Marion	3,142	Volusia	2,250
Gadsden	3,882	Martin	2,107	Wakulla	11,084
Gilchrest	(No Dentist for 7,051 pop.)	Monroe	2,348	Walton	5,561
Glades	(No Dentist for 6,399 pop.)	Nassau	3,223	Washington	3,003
Gulf	5,356				

Source: Florida Dental Association, 1983; and "Projections of Florida Population by County, April 1982," Bureau of Economic and Business Research, University of Florida, 1982.

profession is highly responsive to traditional market place mechanisms. Dentists are mobile and are willing to locate or relocate their practice in areas of economic opportunity represented by growing demand and lower concentrations of dentists. Florida's growing population and economy, its historically low dentist-to-population ratio, and the other amenities associated with Sunbelt states have attracted dentists to the State. A study of the migration trends of dentists by the American Dental Association between 1976 and 1979 showed that Florida gained more dentists from migration than any other single state and by almost a two-to-one margin, the most frequent interstate movement was from New York to Florida.

TABLE 26

IN-STATE AND OUT-OF-STATE APPLICANTS
WHO PASSED THE FLORIDA DENTAL LICENSURE EXAMINATION

Year of Examination	In-State Residents No.	%	Out-of-State Residents No.	%
1979	213	50.1	212	49.9
1980	141	42.5	191	57.5
1981	130	40.8	189	59.2
1982	136	42.0	188	58.0
1983	148	40.5	217	59.5
Total	768	43.5	997	56.5

Source: Florida Board of Dentistry, Dept. of Professional Regulation, 1984

Production of Dentists in Florida

The College of Dentistry at the University of Florida graduates around 60 dentists a year of which approximately 45 set up practice in Florida. As can be seen in Table 27, the impact of Florida graduates on the yearly increase in dentists in Florida is not substantial. Except for one year, the University of Florida graduates represented less than 15 percent of the yearly increase.

Trends in Supply

The supply of dentists is presently increasing at a greater rate than the population both in Florida and in the country at large. Table 20 shows that in 1970 Florida had a rate of 41.3 dentists per 100,000 population and in 1983 the rate is 51.3, an increase of almost 25 percent in the number of dentists per the population. The U.S. figure shows the exact same rate of increase between 1970

TABLE 27

FLORIDA GRADUATES AND INCREASED
NUMBER OF DENTISTS IN FLORIDA

Year	Yearly Increase Of Dentists In Florida	Florida Graduates	Florida Graduates As A Percent of Yearly Increase
1977	269	23	8.5%
1978	743	40	5.3%
1979	(-635)	51	-
1980	1,139	63	5.5%
1981	462	59	12.7%
1982	29	64	220.6%
1983	409	59	14.4%

Source: Florida Board of Dentistry, Department of Professional Regulation and the University of Florida College of Dentistry.

and 1980: 47.1 dentists per 100,000 population in 1970 and 58.6 in 1980, an increase of almost 25 percent. See Table 28. The number of new graduates is expected to stabilize during the 1980s. However, the number of dentists will continue to grow at a rate greater than the population. The population is estimated to grow at a rate of 9.7 percent, while the number of dentists is expected to increase by 25.6 percent over the decade. The Florida population, which is growing at a greater rate than the rest of the country, will experience an even greater rate of growth for the population, 28.0 percent (BEBR, "Projections of Florida Population by Counties: 1985-2020", Bulletin No. 65, June 1983). Because the increase in the number of dentists in the U.S. is expected to be 2.5 times greater than the increase in the U.S. population over the next decade, and assuming that Florida will continue to attract a share of dentists from around the country equal to the share it has attracted in the past, the need of Florida for dentists will continue to be met primarily by in-migration of dentists.

The Effects of Supply and Demand

Recent studies, emanating from concerns about the escalating costs of health care in this country, have argued that the health care industry does not function as other markets where prices decrease as supply increases. Such studies have shown that expenditures for health care and professionals' fees are higher in areas with high concentrations of health care professionals. One attempt to explain this behavior has come to be referred to as the target income hypothesis. Under this argument, providers have a target income and if the supply of providers is so high that the pool of patients is thinned out, then the providers raise fees and manipulate demand to achieve the targeted income. While such a hypothesis has not been proven, substantial research has supported the contentions. In fact, the federal government, which in the sixties and seventies advanced policies designed to increase the supply of health professionals, has more recently reformulated its policies as many areas of shortages have now been addressed and out of concern for possible negative effects of having too many health professionals.

The Balance Between Supply and Demand

There presently exists no consensus on the ideal ratio of dentists to population. Historically, the U.S. has had too few dentists for the population. However, many people feel that the U.S. and Florida in particular have recently entered a period of oversupply. At present, the allegation cannot be independently substantiated. Because demand for dental services is extremely elastic depending on variables such as access and financial resources and because need varies with age and oral health, an oversupply is difficult to determine. One approach to determine adequacy of present supply is to assess dentists own perception of their relative busyness. In a 1979 ADA Survey, twenty-five percent of dentists indicated they were not busy enough and only 52.4 percent reported they had enough patients. Fifteen percent reported they were "overworked" and eight percent described themselves as "too busy." In the South Atlantic region which would include Florida, thirty percent indicated they were not busy enough and less than half (47.7 percent) reported they had enough patients. In a 1981-82 survey of licensed dentists in Florida, 65 percent reported that there were more than an adequate number of dentists in their area, 33 percent reported that there were an adequate number and less than two percent reported there were less than an adequate number.

TABLE 28

Number of Active[1] Dentists in the U.S. and Dentist-to-Population Ratios for Selected Years: 1950-1980

Year	Total Active Dentists[2]	Active Civilian Dentists[3]	Civilian Population[3]	Active Civilian Dentists per 100,000 Civilian Population	Total Civilian Persons Per Active Civilian Dentists
1950	79,190	75,310	151,238,000	49.8	2,008
1955	84,370	78,270	164,597,000	47.6	2,103
1960	90,120	84,500	179,780,000	47.0	2,127
1965	95,990	89,640	192,951,000	46.5	2,149
1970	102,220	95,680	203,109,000	47.1	2,123
1971	103,350	97,210	205,496,000	47.3	2,115
1972	105,400	98,860	207,306,000	47.7	2,097
1973	107,280	100,780	208,951,000	48.2	2,073
1974	109,430	103,030	210,555,000	48.9	2,044
1975	112,020	106,740	212,296,000	50.3	1,989
1976[4]	121,097[5]	115,877[5]	213,925,000	54.2	1,846
1977[4]	124,380	119,380	215,755,000	55.3	1,807
1978[4]	127,358	122,758	217,604,000	56.4	1,773
1979[4]	131,041	125,905	219,642,000	57.3	1,745
1980	134,226	129,064	220,257,000[6]	58.6	1,707

[1]Excludes all dentists who reported that they are retired or are involved in another occupation unrelated to dentistry.

[2]Includes military personnel.

[3]Excludes military personnel.

[4]Population and manpower figures are as of the end of each year.

[5]1976 is the first year for which figures are based on a nationwide distribution survey conducted by the American Dental Association. Previous to this time, manpower figures are based upon information compiled by the Bureau of Membership Records, American Dental Association.

[6]Population estimate is as of May 1, 1980.

Sources: Health Resources Administration, Bureau of Health Manpower, Division of Dentistry, based on data from the American Dental Association, Bureau of Research and Statistics, and the U.S. Bureau of the Census, Current Population Reports, Series P-25, Nos. 439 and 647 for years 1950-1975. Subsequent years: American Dental Association, Bureau of Economic and Behavioral Research, Distribution of Dentists, 1976 & 1979, Survey of Recent Dental Graduates, 1978 & 1979, Current Population Reports, Series P-25, No. 868, July 1980, and information obtained from the Bureau of Membership Records, American Dental Association.

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VII. THE EDUCATION OF DENTISTS IN FLORIDA

The University of Florida College of Dentistry is the only dental school in Florida. The college is located in Gainesville in conjunction with the University's J. Hillis Miller Health Center. There are currently 308 students enrolled for the 1983-84 academic year.

History

The Florida Legislature designated the University of Florida as the site of a proposed college of dentistry in May 1957. It became one of fourteen new dental colleges constructed in the last two decades. Dr. Edmund Ackell became the first dean of the College of Dentistry in 1966 and funds were provided by the Legislature to initiate physical planning and to recruit additional faculty members. Shortly afterwards, the Council on Dental Education of the American Dental Association granted the college eligibility status for accreditation.

Educational activities began in 1968 with the addition of four faculty members and the presentation of the first continuing education program in January. Late in 1968 the Florida Board of Regents approved the building expansion program for the J. Hillis Miller Health Center at the University of Florida and the Florida Legislature appropriated 11 million dollars of the estimated 30 million dollars needed to complete it. The remaining funds were to come from a construction grant from the National Institutes of Health. Twelve million dollars of the NIH funds were designated for the College of Dentistry.

Dr. Jose E. Medina was appointed dean in 1969 when Dr. Ackell became Vice-President of the Health Center. A curriculum planning committee recommended a highly innovative flexible modular curriculum for the dental college which received considerable national attention. In 1973 a contract was awarded by the National Institute of Health (NIH) to the College to present two national curriculum forums. Representatives from all the dental schools in the United States assembled at the Health Center for a three-day presentation by the College faculty on the flexible modular curriculum and the use of audio visual materials for self-instruction. The second forum was held in 1975 and a procedure was established for sharing audio visual materials developed at dental schools throughout the nation. Still in use today, the curriculum is competency-based rather than time-based.

When in 1970 the federal government released the NIH funds, increased construction costs had pushed the budget over the allocated state funds. A joint resolution by the Florida Legislature approved transferring 3 million dollars from equipment to construction funds to permit the project to be initiated. Groundbreaking occurred on May 22, 1971.

The first class of 24 dental students entered the University of Florida College of Dentistry in September 1972, attending classes in temporary facilities. In 1973 a temporary dental clinic of 27 operatories was opened. In the Fall of 1973, the second class of 24 students began their studies. In Fall of 1974, Dr. Don Allen was appointed dean and the third class of 40 students enrolled. In 1975 the permanent facility for the College of Dentistry was completed and student dentists began seeing patients for the first time. That Fall 60 students entered the College and students were at all curriculum levels for the first time. In 1976 the Dental Sciences Building was formally dedicated, the

College was granted full accreditation by the Commission on Dental Accreditation, and the first class of student-dentists was graduated.

A dental outreach clinic, the Lafayette County Dental Health Center, was established by the College in Mayo, Florida in 1977. All students spend several weeks treating patients in this rural community. In November 1979, the College signed a sisterhood agreement with the Tokyo Dental College. During the 1980-81 school year, the faculty exchange program between the two schools began, and it was expanded during 1981-82.

In the Fall of 1980, the College reached the planned maximum class size when it enrolled 308 students. In October 1983, Dr. Donald Legler, former associate dean for research and advanced education at the University of Minnesota, became the current Dean of the College.

Enrollment

The University of Florida has a first-year class enrollment of 81 students which is considered small. Of the public dental schools in the southern states, five have a larger enrollment and eight have a smaller enrollment. Among the public dental schools in the ten largest states, ten have a larger enrollment and two a smaller enrollment. See Tables 29 and 30. The original plans for the UF College of Dentistry called for an entering class enrollment of eighty students. This number was achieved in 1981-82 and enrollment has remained constant since then. See Table 31.

There are no plans at present to increase the number. Applicants for enrollment have been declining since 1979. This decrease reflects a national trend. In 1981, 620 people applied for the eight slots at the UF College. (It should be noted that most applicants apply to an average of six different schools.) See Table 32.

Access for Florida Residents

The State of Florida has fewer slots in in-state dental schools than any of the comparison states. As shown in Tables 29 and 30, among the southern states, the mean number of slots is 128 with a ratio of 2.52 slots per 100,000 people. Among the ten largest states, the mean number of slots is 293 with a ratio of 2.53 slots per 100,000 population. In 1982-83, fifty-nine Florida residents pursued dental education outside of Florida. Twenty of these students were subsidized by the State at the Emory School of Dentistry under the Academic Common Market program. The other 39 were enrolled in 23 schools around the country. See Table 33.

In 1981, UF College of Dentistry accepted 10 out-of-state students or 12.5 percent of the total entering enrollment. The mean for public schools around the country is 11.3 percent. See Table 34. Currently 2.7 qualified Florida residents apply for each available slot at the College.

Enrollment of Minorities and Women

At present, fourteen blacks, 30 Hispanics, 10 Asians and two American Indians are enrolled at the UF College of Dentistry. The low black enrollment is of concern as the fourteen students represent less than five percent of the total

TABLE 29

FIRST YEAR PUBLIC AND PRIVATE DENTAL ENROLLMENTS
FOR THE SOUTHERN STATES
AND RATE PER 100,000 POPULATION
1980

State	First-Year Enrollment	Enrollment per 100,000 Population
Alabama	72	1.85
Florida	66	.67
Georgia	168	3.06
Kentucky	146	3.99
Louisiana	101	2.39
Maryland	138	3.27
Mississippi	48	1.90
North Carolina	86	1.49
South Carolina	57	1.82
Tennessee	184	4.00
Texas	415	2.90
Virginia	113	2.11
West Virginia	64	3.28
MEAN	128	2.52

Source: Statistical Abstract of the U.S., 1982-83 and American Dental Association, Supplement 11 to the Annual Report 1981-82 on Dental Education

TABLE 30

FIRST-YEAR PUBLIC AND PRIVATE DENTAL ENROLLMENTS
FOR THE TEN LARGEST STATES
AND RATE PER 100,000 POPULATION
1980

State	First-Year Enrollment	Enrollment per 100,000 Population
California	586	2.47
Florida	66	.67
Illinois	489	4.28
Massachusetts	226	3.94
Michigan	235	2.54
New Jersey	178	2.41
New York	389	2.21
North Carolina	86	1.49
Ohio	260	2.41
Texas	415	2.90
MEAN	293	2.53

Source: Statistical Abstract of the U.S., 1982-83; American Dental Association, Supplement II to the Annual Report 1981-82 on Dental Education

TABLE 31

ENROLLMENT IN THE COLLEGE OF DENTISTRY
UNIVERSITY OF FLORIDA

Class	1972 -73	1973 -74	1974 -75	1975 -76	1976 -77	1977 -78	1978 -79	1979 -80	1980 -81	1981 -82	1982 -83	1983 -84
Entering Class	24	24	40	60	60	61	67	66	66	80	81	78
All Four Classes	24	48	88	147	184	221	242	249	256	273	292	308
Graduates	First Class Graduated 1976			22	23	40	51	63	59	64	59	

Source: College of Dentistry, University of Florida, 1983.

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TABLE 32

NUMBER OF APPLICATIONS TO DENTAL SCHOOLS
1960-1981

INSTITUTION	1960	1965	1970	1975	1976	1977	1978	1979	1980	1981
ALABAMA	191	249	578	696	586	579	374	426	350	381
PACIFIC	365	656	1331	3370	2909	2284	1831	1492	1335	1295
CALIF SF	306	417	1142	1541	1058	799	743	692	669	640
CALIF L.A.	0	530	1285	2126	2069	1842	1489	1210	1110	873
S. CALIF.	427	650	1311	2900	2925	1740	1322	1057	886	886
LOMA LINDA	167	340	740	1961	1441	1947	1194	1199	1009	845
COLORADO	0	0	485	334	122	201	171	313	266	245
CONNECTICUT	0	0	1077	1028	989	841	746	790	653	673
GEORGETOWN	446	686	1479	3902	4359	3891	2496	2825	2441	1661
HOWARD	169	315	755	1897	1880	2013	1716	1385	1264	1217
FLORIDA	0	0	458	713	351	757	654	712	635	620
EMORY	336	419	1394	3066	2615	2993	3120	2642	1774	1173
GEORGIA	0	0	645	1084	366	400	250	222	182	165
LOYOLA	343	588	1716	3577	3498	3617	1693	2473	2135	2005
NORTHWESTERN	478	739	1956	4511	4277	3798	3328	2666	2426	1789
SO. ILLINOIS	0	0	0	577	282	294	271	245	460	474
ILLINOIS	278	499	970	970	594	577	593	445	540	557
INDIANA	162	267	717	706	644	696	512	647	627	292
IOWA	34	266	712	1383	99	810	694	685	692	752
KENTUCKY	0	349	1070	367	541	522	412	339	247	223
LOUISVILLE	324	745	1529	952	926	759	475	440	315	351
LOUISIANA	0	0	699	391	521	186	193	177	172	162
MARYLAND	451	724	1434	1316	1297	1295	1036	1141	1134	1135
HARVARD	0	118	353	1103	831	807	916	577	537	401
BOSTON	0	0	0	1701	1947	1774	1690	1505	1380	1159
TUFTS	410	692	1339	3853	3866	3844	3279	2461	2461	1824
DETROIT	226	459	1256	1780	631	1359	973	653	510	453
MICHIGAN	419	614	1043	1522	1312	1206	930	782	807	739
MINNESOTA	238	332	797	957	890	658	596	585	559	646
MISSISSIPPI	0	0	0	428	109	450	115	109	97	98
MISSOURI	447	626	946	652	699	805	477	405	363	279
WASH S.L.	366	656	1242	4303	4300	4278	3383	2209	1991	1991
CREIGHTON	271	553	1484	1516	1465	1404	995	825	670	548
NEBRASKA	164	278	906	427	371	224	212	223	160	261
FAIRLEIGH D.	467	963	1639	2824	2789	2834	2545	1951	1692	1318
NEW JERSEY	386	641	1173	1230	1176	1152	1236	1180	998	950
COLUMBIA	192	336	887	2273	2433	2377	2008	1274	1077	901
NEW YORK	451	783	1519	3144	3854	3100	2950	1850	1525	1336
STONY BROOK	0	0	0	1293	1362	1365	1066	929	819	905
BUFFALO	222	589	1048	1823	1898	1497	943	825	764	711
N. CAROLINA	132	178	639	1052	1184	994	940	679	614	598
OHIO	269	429	917	553	581	866	773	980	1141	1184
CASE WESTERN	292	534	1240	3083	2831	3051	2745	2469	2036	1826
OKLAHOMA	0	0	0	398	520	518	387	355	358	376
ORAL ROBERTS	0	0	0	0	0	0	205	744	579	443
OREGON	183	399	749	342	422	327	327	222	197	189
TEMPLE	609	1069	1870	1890	1839	2024	1611	1493	1391	1301
PENNSYLVANIA	458	744	1358	2945	3082	3113	2800	2248	2071	1766
PITTSBURGH	319	602	1386	990	1015	1015	614	548	474	477
S. CAROLINA	0	0	381	194	274	270	213	161	144	116
MEHARRY	53	204	775	787	922	833	612	877	425	425
TENNESSEE	306	525	1449	347	550	371	356	316	279	277
BAYLOR	261	562	1082	999	1032	1012	940	815	749	606
HOUSTON	161	286	801	866	802	788	736	672	602	542
TEXAS S.A.	0	0	0	870	804	786	725	672	595	527
VIRGINIA	189	341	885	1923	1199	359	300	380	387	252
WASH SEATTLE	214	228	791	979	376	351	303	312	301	740
W. VIRGINIA	48	410	1010	593	427	314	211	791	869	871
MARQUETTE	491	943	1595	3196	2749	2399	1758	1101	993	1143
PUERTO RICO	66	141	224	304	292	399	402	314	291	302
TOTAL	12847*	23654*	56267*	92508	86081	81765	66585	58715	52218	46894

*Does not include applications to St. Louis U. (1960=259; 1965=625; 1970=419) and to Loyola U., New Orleans (1960=324; 1965=636

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TABLE 33

LIST OF SCHOOLS ATTENDED BY FLORIDA RESIDENTS
AND THE NUMBER AT EACH SCHOOL (1982-83)

State	Institution	Number of Florida Residents
Alabama	Univ. of Alabama	1
California	Univ. of the Pacific	1
	Loma Linda University	1
District of Columbia	Georgetown University	5
	Howard University	3
Florida	University of Florida	74
Georgia	Emory University	20
Illinois	Loyola University	1
	Northwestern University	2
Indiana	Indiana University	1
Maryland	University of Maryland	4
Massachusetts	Boston University	1
	Tufts University	4
Missouri	Washington Univ., St. Louis	1
New Jersey	Fairleigh Dickinson Univ.	1
	Univ. of Medicine and Dentistry of N. J.	2
New York	New York University	1
Ohio	Ohio State University	1
Pennsylvania	Temple University	1
	Univ. of Pittsburg	1
South Carolina	Medical Univ. of S.C.	1
Tennessee	Meharry Medical College	1
Texas	Univ. of Texas at Houston	1
Virginia	Virginia Commonwealth Univ.	3
Wisconsin	Marquette University	1
Source: ADA Annual Report Dental Education, 1982-83	TOTAL	155 residents of Florida

TABLE 34

NUMBER AND PERCENT OF NON-RESIDENT STUDENTS IN THE FIRST-YEAR CLASS
1970-1981

		1970		1975		1978		1979		1980		1981	
TYPE	DENTAL SCHOOL	N-RES	%	N-RES	%	N-RES	%	N-RES	%	N-RES	%	N-RES	%
PUBLIC													
	ALABAMA	8	13.6	2	2.8	1	1.3	3	4.2	8	11.1	3	4.4
	CALIF SF	3	3.7	1	1.1	1	.9	0	0.0	0	0.0	0	0.0
	CALIF L.A.	8	8.2	13	12.3	1	.9	3	2.8	3	2.8	2	1.9
	COLORADO	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	CONNECTICUT	7	43.8	2	3.8	3	6.0	7	12.7	4	7.8	9	18.4
	FLORIDA	0	0.0	4	6.7	3	4.5	4	6.1	3	4.5	10	12.5
	GEORGIA	2	5.4	2	3.1	1	1.6	1	1.6	1	1.6	0	0.0
	SO. ILLINOIS		**	0	0.0	0	0.0	0	0.0	1	1.9	2	3.8
	ILLINOIS	3	2.9	1	.7	0	0.0	0	0.0	0	0.0	0	0.0
	INDIANA	9	8.5	8	6.2	5	3.9	4	3.1	7	5.3	19	16.4
	IOWA	17	23.9	7	7.3	15	15.6	22	22.9	17	18.1	26	29.9
	KENTUCKY	9	16.7	4	6.7	4	6.7	2	3.3	3	5.0	5	8.6
	LOUISVILLE	57	68.7	11	12.4	8	9.2	6	7.1	8	9.3	6	7.8
	LOUISANA	0	0.0	2	2.1	10	9.9	13	12.9	11	10.9	10	10.3
	MARYLAND	58	45.3	10	7.2	23	16.7	30	21.4	42	30.4	35	31.0
	MICHIGAN	9	7.0	1	.7	4	2.6	3	1.9	3	2.0	5	3.3
	MINNESOTA	12	10.0	19	12.7	20	13.4	28	18.7	23	15.3	40	27.0
	MISSISSIPPI		**	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	MISSOURI	54	36.0	55	34.4	55	34.4	57	35.4	53	33.1	56	35.2
	NEBRASKA	19	31.7	12	18.2	10	15.6	10	15.2	9	13.6	19	28.4
	NEW JERSEY	16	27.6	5	7.8	9	9.8	8	8.7	17	18.3	11	11.2
	STONY BROOK		**	2	8.3	0	0.0	0	0.0	0	0.0	0	0.0
	BUFFALO	4	4.9	1	1.1	1	1.1	2	2.3	2	2.2	2	2.3
	N. CAROLINA	10	13.3	13	15.7	13	15.7	10	12.2	12	14.0	13	15.3
	OHIO	1	.6	2	1.0	20	9.5	24	11.4	18	11.2	20	12.3
	OKLAHOMA		**	0	0.0	2	2.8	3	4.1	3	4.1	5	7.0
	OREGON	30	35.3	13	15.7	11	12.8	10	12.2	17	21.2	14	18.4
	S. CAROLINA	1	2.0	0	0.0	1	1.8	0	0.0	0	0.0	1	1.8
	TENNESSEE	42	38.9	22	28.2	23	14.5	23	14.2	29	22.3	28	21.1
	HOUSTON	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
	TEXAS S.A.		**	0	0.0	0	0.0	3	2.0	8	5.3	9	6.1
	VIRGINIA	47	48.0	20	18.2	8	7.2	22	19.8	20	17.7	19	16.8
	WASH SEATTLE	12	14.5	9	9.0	27	27.0	25	25.0	31	30.7	22	25.6
	W. VIRGINIA	19	31.1	1	1.6	12	19.0	15	23.8	14	21.9	10	19.2
	PUERTO RICO	0	0.0	1	1.5	1	1.5	0	0.0	0	0.0	0	0.0
MEAN			18.05		7.034		7.597		8.709		9.764		11.31
STATE REL													
	LOYOLA	44	34.4	47	33.8	27	18.2	39	26.5	25	16.7	35	23.6
	NORTHWESTERN	65	67.0	71	67.6	80	69.6	92	77.3	88	73.3	73	63.5
	DETROIT	19	21.8	1	1.0	0	0.0	4	4.7	4	4.7	2	2.3
	FAIRLEIGH D.	31	41.3	35	42.2	21	25.0	18	21.4	17	20.0	19	22.9
	COLUMBIA	14	29.8	11	21.2	8	13.1	12	19.4	5	8.3	9	15.0
	NEW YORK	23	12.8	18	9.4	62	15.2	25	11.8	37	17.5	36	20.9
	CASE WESTERN	46	50.0	40	39.2	34	34.0	42	41.6	38	38.0	38	36.5
	TEMPLE	46	33.1	24	16.1	25	16.0	14	9.0	22	14.7	13	9.9
	PITTSBURGH	4	3.2	5	3.7	18	16.7	22	20.2	14	12.8	11	10.1
	BAYLOR	36	34.3	15	11.6	26	18.7	48	28.1	22	15.6	21	15.0
MEAN			32.78		24.58		22.65		25.99		22.16		21.98

** DENTAL PROGRAM WAS NOT IN OPERATION.

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students yet blacks represent 14 percent of the Florida population. During the entire operation of the College, 29 blacks have enrolled (4.1 percent). There is a very slight trend toward increased enrollment of blacks but not a significant trend yet. Hispanics are adequately represented in numbers slightly higher than their percentage of the population. See Table 35.

The number of women in the College has increased steadily since the College opened in 1972. Women now represent slightly less than 20 percent of the College and the numbers are expected to increase.

Graduates

A total of 381 dental students have graduated in eight classes from 1976 through 1983 (See Table 36). Of these graduates, 283 or 74 percent are currently practicing dentistry in Florida. Eighteen graduates are continuing their dental education in Florida and six are dental institutional personnel. There are 28 dental graduates currently in the military, 20 are out-of-state practicing or teaching, 21 are in out-of-state residency programs, and four are practicing out of the country. There are two graduates not practicing dentistry and seven whose addresses are unknown. See Table 37. Ninety-seven percent of the University of Florida Dental School graduates pass the Florida State Board Exam on the first attempt.

Minorities and Women Among Graduates

Of the 381 total graduates from the University of Florida Dental School, 2.6% are black and 6.8 percent are Hispanic. The difference in minority enrollment over the last 11 years is represented below:

TABLE 38

Graduates by Race at the University of Florida College of Dentistry

	1972		1976		1978		1980		1983	
	No.	%	No.	%	No.	%	No.	%	No.	%
Black	1	4%	0	0%	4	6%	1	1.5%	3	3.8%
Hispanic	1	4%	6	10%	2	3%	8	12%	12	15%
Asian	0	0%	1	1.6%	0	0%	3	4%	5	6.4%
American Indian*	0	0%	0	0%	0	0%	0	0%	0	0%

Source: University of Florida College of Dentistry, 1983.

* It is important to note that one American Indian student was enrolled in each entering class in 1974 and 1977, and two American Indian students were enrolled in fall of 1981.

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TABLE 35

ENROLLMENT BY RACE IN THE
COLLEGE OF DENTISTRY OF THE UNIVERSITY OF FLORIDA 1982-83

Class	White		Black		Hispanic		Asian		American Indian	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Entering Class	62	76.5	6	7.4	10	12.3	3	3.7	0	-
All Four Classes	236	80.8	14	4.8	30	10.3	10	3.4	2	0.7
Graduates	48	81.4	2	3.4	6	10.2	3	5.1	0	-

Source: College of Dentistry, University of Florida, 1983.

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TABLE 36

TOTAL GRADUATES BY RACE AND ETHNICITY
IN THE COLLEGE OF DENTISTRY AT THE UNIVERSITY OF FLORIDA
1976-1983

Race or Ethnicity	Total Graduates	
	Number	Percent
White	339	89.0
Black	10	2.7
Hispanic	26	6.8
Asian	4	1.0
American Indian	2	0.5
Total	381	100.0

Source: University of Florida, College of Dentistry, 1983

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TABLE 37

DISTRIBUTION OF DENTISTS

GRADUATED FROM THE UNIVERSITY OF FLORIDA COLLEGE OF DENTISTRY

Jacksonville area		29
St. Augustine		3
Palm Coast area		2
Rural (northeast Florida)		6
	Total	40
Tallahassee		10
Panama City		2
Pensacola		9
Fort Walton area		16
Rural (northwest Florida)		12
	Total	49
Gainesville (practice)		6
(education)		9
(enrolled in resident programs - dental and medical		9
(last known address)		7
(institutional)		6
Ocala		5
Orlando		18
Daytona/Melbourne area		20
Rural (central Florida)		23
	Total	103
Vero Beach/Ft. Pierce/Stuart area		5
Miami		30
Hollywood		4
Ft. Lauderdale area		14
West Palm Beach area		9
	Total	62
Tampa Bay		24
Sarasota/Bradenton		13
Lower west coast		5
Rural (west coast of Florida)		17
Lakeland		1
	Total	60
Military		28
Out-of-state practice or teaching institutions		20
Out-of-state residency programs		21
Out-of-country practice		4
Not practicing Dentistry		2

TABLE 40

REQUIRED FEES PER YEAR (12 MONTHS) FOR MEDICAL PROGRAMS[1], 1982-83

Fee Type	Amount
RESIDENT STUDENTS:	
Matriculation Fee	$1,683.60
Building Fee	72.60
Student Financial Aid Fee	17.40
General Student Aid Fee	24.60
Capital Improvement Trust Fund Fee	77.40
Activity and Service Fee	161.40
Total Registration for Florida Students	$2,037.00
NON-RESIDENT STUDENTS:	
Tuition for Non-Florida Students	2,726.00
Total Registration for Non-Florida Students (Includes Registration Fees).	$4,763.00

[1]Includes the Medical, Dentistry and Veterinary Medicine Programs at the University of Florida, and the Medicine Program at the University of South Florida.

SOURCE: Florida Administrative Code, Chapter 6C-7, Rules of the Board of Regents.

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TABLE 41

PUBLIC DENTAL SCHOOLS, SOUTHERN STATES

Rank Order of First-Year Resident Tuition and General Fees
1982-83

Rank Order	Dental School	Resident Tuition	General Fees	Total Tuition and Fees
1	U. of Texas, Houston	$ 400	$ 54	$ 454
2	Univ. of Texas, SA	300	181	48[illegible]
3	Univ. of N. Carolina	1231	573	1804
4	Louisiana St. Univ.	0	2000	2000
5	West Virginia Univ.	1724	360	2084
6	Med. Col. of Georgia	2052	51	2103
7	Univ. of Florida	2106	0	2106
8	Med. U of S. Carolina	2111	0	2111
9	Univ. of Kentucky	2140	0	2140
10	Univ. of Louisville	2171	0	2171
11	Univ. of Alabama	1800	456	2256
12	Univ. of Tennessee	2538	87	2625
13	Univ. of Mississippi	3039	0	3039
14	Virginia Comm. Univ.	3500	0	3500
15	Univ. of Maryland	3658	136	3794
Mean		1918	260	2178

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TABLE 42

PUBLIC DENTAL SCHOOLS
TEN LARGEST STATES [1]

Rank Order of First-Year Resident Tuition and General Fees
1982-83

Rank Order	Dental School	Resident Tuition	General Fees	Total Tuition and Fees
1	U. of Texas, Houston	$ 400	$ 54	$ 454
2	Univ. of Texas, SA	300	181	481
3	Univ. of California, LA	0	1226	1226
4	Univ. of California, SF	0	1281	1281
5	So. Illinois Univ	1575	79	1654
6	Univ. of N. Carolina	1231	573	1804
7	Univ. of Florida	2106	0	2106
8	Univ. of Illinois	1680	483	2163
9	Ohio State Univ.	3024	0	3024
10	SUNY, Stony Brook	4300	25	4325
11	SUNY, Buffalo	4300	95	4395
12	Univ. of Michigan	4404	100	4504
13	New Jersey College	5500	200	5700
Mean		2217	331	2547

1 Massachusetts, one of the ten largest states, has three private dental schools; however, there are no public dental schools.

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It is apparent that black students are under-represented in the enrollment and graduation figures at the University of Florida College of Dentistry. One barrier to recruiting minority students is a decrease in the availability of resources for scholarships and loans.

Of the 381 total graduates of the University of Florida College of Dentistry, 57 or 14.7 percent are female. Females in the graduation population of the University of Florida Dental School are represented below:

TABLE 39

Women Graduates at the University of Florida
College of Dentistry

1976		1978		1980		1983	
No.	%	No.	%	No.	%	No.	%
1	4%	3	7.5%	12	19%	11	18%

Source: University of Florida, College of Dentistry, 1983

It is expected that the numbers and percentages of female dental school enrollments and graduates will increase. It has been predicted that they will represent 50 percent of enrollees at the turn of the century.

Tuition

Resident tuition at the College of Dentistry is $2,037.00 for twelve months. The tuition is slightly below the mean for public dental schools in the southern states and the ten largest states. The resident tuition represents approximately 10 percent of the annual cost of educating one dental student. See Tables 40, 41, and 42.

Advanced Education Programs

There are seven Advanced Education Programs at the College of Dentistry. Advanced Education Programs are designed for graduates of the regular dental program. See Table 43. In 1983, there were 229 total applicants representing thirty states and twenty-four foreign countries (Table 44). Six applicants were accepted in the General Practice Residency Program, one in Oral Surgery, two in Orthodontics, one in Pedodontics, and two in Periodontics. See Tables 45 and 46. The length of the Oral and Maxillofacial Surgical Residency Program is being increased from three to four years in keeping with national trends. The Oral Pathology Residency Program is being closed for a period of one year due to the lack of potential job opportunities available to graduates. The College decided that improvement in the demand for oral pathologists should occur before any more dentists are trained. The field appears saturated at the moment.

TABLE 43

UNIVERSITY OF FLORIDA COLLEGE OF DENTISTRY
ADVANCED EDUCATION PROGRAM ENROLLMENTS

	Total - 1982-83
Oral and Maxillofacial Surgery	3
General Practice	3
Oral Pathology	5
Orthodontics	4
Periodontics	4
Dental Public Health	1
Pedodontics	1
Graduate Program Sponsored Jointly by Departments of Dental Biomaterials and Materials Science and Engineering	2

University of Florida College of Dentistry, 1983

TABLE 44

APPLICANT SUMMARY - POST GRADUATE PROGRAMS 1983-84
Summary of applicants by state and foreign country

U.S.A.		FOREIGN	
CALIFORNIA	11	BAHAMAS	1
COLORADO	1	BURMA	1
DELAWARE	1	CANADA	5
FLORIDA	42	CHINA	1
GEORGIA	10	COLOMIBA	5
ILLINOIS	11	EGYPT	1
INDIANA	4	ENGLAND	1
IOWA	3	GREECE	1
KANSAS	1	INDIA	2
KENTUCKY	4	IRAN	2
LOUISIANA	5	IRAQ	1
MARYLAND	2	JAPAN	1
MASSACHUSETTS	5	KOREA	1
MICHIGAN	5	NEPAL	1
MISSISSIPPI	3	PAKISTAN	2
MISSOURI	5	PANAMA	3
NEBRASKA	4	PUERTO RICO	4
NEW JERSEY	5	S. AFRICA	1
NEW YORK	10	SWEDEN	2
NORTH CAROLINA	6	SYRIA	1
OHIO	6	TAIWAN	5
OKLAHOMA	1	TANZANIA	1
OREGON	2	THAILAND	1
PENNSYLVANIA	3	VENEZUELA	1
SOUTH CAROLINA	5		
TENNESSEE	6		
TEXAS	3		
VIRGINIA	15		
WASHINGTON	2		
WISCONSIN	3		

TOTALS U.S. 184 Applicants FOREIGN 45 Applicant

GRAND TOTAL OF 229 APPLICANTS
178

Source: University of Florida College of Dentistry, 1983

TABLE 45

SUMMARY OF 1983 ADVANCED EDUCATION PROGRAM RESIDENTS ACCEPTED

	PROGRAM	NAME	STATE OF RESIDENCE	NAME OF COLLEGE GRADUATED
1.	G.P.R.	Blake, W. Randall	Florida	Univ. of Florida
2.	G.P.R.	Frazier,B.Kevin	Florida	Univ. of Florida
3.	G.P.R.	Panczyszyn, John	Illinois	Loyola Univ.
4.	G.P.R.	Phipps, Keith,E.	Maryland	Univ. of Maryland
5.	G.P.R.	Staudt, Edward L.	Virginia	Med. Col. of Va.
6.	G.P.R.	White, Charlotte S.	Florida	Univ. of Florida
7.	Oral Surg.	Burchfield, Tommie L.	Mississippi	Univ. of Miss.
8.	Ortho.	LeCompte, Joseph E.	Virginia	Med. Col. of Va.
9.	Ortho.	Thompson, Jeffery S.	Florida	Univ. of Florida
10.	Pedo.	Mc Aninch, Si	Georgia	Emory Univ.
11.	Perio.	Brock, David L.	Florida	Univ. of Florida
12.	Perio.	Fetner , Alan E.	Florida	Univ. of Florida

Source: University of Florida College of Dentistry, 1983

TABLE 46

SUMMARY OF 1983 ADVANCED EDUCATION PROGRAM APPLICANTS

TOTAL INQUIRIES FOR PROGRAMS----------585

TOTAL NUMBER OF COMPLETED APPLICATIONS----------229

APPLICANTS CAME FROM 24 FOREIGN COUNTRIES, WITH CANADA, COLOMBIA AND TAWAIN WITH 5 APPLICANTS EACH.

APPLICANTS CAME FROM 30 DIFFERENT STATES. THE TOP THREE WERE FLORIDA WITH 42, VIRGINIA WITH 15 AND CALIFORNIA AND ILLINOIS TIED WITH 11 APPLICANTS EACH.

APPLICANTS BY PROGRAMS

1983

PROGRAM:	DENT. PUB. HEALTH	G.P.R.	ORAL PATH.	ORAL SURG.	ORTHO	PEDO.	PERIO	TOTAL
NUMBER OF APPLICANTS	0	76	6	52	50	10	35	229
NUMBER OF FEMALES	0	14	1	1	6	0	1	23
NUMBER OF BLACKS	0	2	0	0	0	1	0	3
NUMBER OF HISPANICS	0	4	1	1	3	0	3	12

Source: University of Florida College of Dentistry, 1983

Faculty

The College of Dentistry has 84 full-time faculty, 30 part-time faculty, and 11 who are shared with the College of Medicine. The faculty members are engaged in teaching, research, writing and other professional activities. Many are widely published in their fields and participate in research with funding from national and corporate sources.

Approximately 50 percent of the faculty members are involved in the College Faculty Practice. All revenue generated by this practice is returned to the College of Dentistry. Each faculty participant is allowed to practice one day a week. No College of Dentistry faculty member is allowed to practice outside this College Faculty Practice.

Faculty-Student Ratio

The University of Florida dental school has a ratio of 3 students and 1 faculty member. The average among other public dental schools in the South is 4.4 students for every faculty member. When total full-time and part-time faculty are considered together, Florida's faculty-student ratio remains three students for one faculty member. The average among the southern schools for the total faculty-student ratio is also 3 students for 1 faculty member.

Research

The Periodontal Disease Research Center is supported by external grant funding and funds from the budget of the Department of Basic Dental Sciences. In 1982-83 there were 18 faculty members participating. A list of grants funded by the National Institute of Health is found in Table 47. The Center involves dental faculty from five of the College's departments, dental students, and faculty from other colleges within the University. Current projects seek to identify the micro-organisms which cause periodontal diseases, to determine the mechanisms of colonization of these pathogens, and to understand how immune mechanisms operate in the periodontium causing tissue destruction. Other areas of research at the College of Dentistry include bioglass tooth implants, dental bio-materials, mandibular movement and occlusion, behavioral management of fearful dental patients and biochemical factors in bone and root resorption. In conjunction with the Division of Sponsored Research, the Center sponsors a Distinguished Scientist Seminar Series. Four lectures were held with visiting scientists from Geneva, Tokyo, and two from the Forsyth Dental Center in Boston.

In addition to the Research Center, the faculty in each department of the College of Dentistry are involved in other research efforts. Funds for research come from a variety of sources. In 1983, the College of Dentistry Research Support provided seed money grants totaling $7,016. Supplemental funding totaled $5,400 and was awarded to investigators with on-going research projects.

Continuing Education

The L.J. Anderson, Sr. Clinic, designed for participation in continuing education courses, was established in 1975. From 1967 to 1982, the College has presented 473 continuing education programs for 16,744 dentists and dental auxiliary personnel, with courses located both at the University and throughout the State.

TABLE 47

UNIVERSITY OF FLORIDA COLLEGE OF DENTISTRY PERIODONTAL DISEASE RESEARCH CENTER GRANTS

1. NIH Grants
   a. DE04844: "Stress-induced bone resorption" - year three of a three-year grant (Total Direct Costs - $74,134; G.J. King, Principal Investigator).
   b. DE05429: "Adherence of periodontal disease-associated bacteria" - year two of a three-year grant (Total Direct Costs - $211,960; W.B. Clark, Principal Investigator).
   c. DE06070: "Antibiotic susceptibilities of periodontal bacteria" - year two of a three-year grant (Total Direct Costs - $141,731, C.B. Walker, Principal Investigator).
   d. DE06231: "Monoclonal antibody analysis of plaque micro-organisms" - year one of a three-year grant (Total Direct Costs - $194,000; W.P. McArthur, Principal Investigator).
   e. DE06354: "Functional inhibitions assay to detect salivary antibodies" - year one of a two-year grant (Total Direct Costs - $15,000; W.B. Clark, Principal Investigator).
   f. DE06605: "Modulation of leukocyte functions by dental-related metals" - year one of a two-year grant (Total Direct Costs - $15,000; W.P. McArthur, Principal Investigator).
   g. DE00112: "Cellular Interactions in Periodontal Disease" - year five of a Research Career Development Award (Total Direct Costs - $35,904/year; W.P. McArthur, Principal Investigator).
   h. DE00115: "Adsorption of periodontopathogens in dental plaque" - year one of a Research Career Development Award (Total Direct Costs - $35,904/year; W.B. Clark, Principal Investigator).

2. Other Grants
   a. The Upjohn Company: "Usage of clindamycin as adjunct in periodontal disease" (Total Direct Costs - $27,500; C.B. Walker, Principal Investigator).
   b. Johnson & Johnson, Inc.: "Protocol for evaluation of murine model for studying accelerated alveolar bone loss induced by Bacteroides gingivalis" (Total Direct Costs - $10,000; W.B. Clark, Principal Investigator).

Source: University of Florida College of Dentistry, 1983

The continuing dental education program increased in numbers from 107 programs in 1982 to 122 programs in 1983. The increase is attributed to progress of the Comprehensive Dentistry Certificate Program which was initiated in September, 1981. The program is offered to qualified graduates of accredited dental schools. The program consists of classroom instruction, laboratory exercises, clinical experiences which include in-office projects, and evaluation. The instruction is provided at the College of Dentistry and other selected locations throughout the State. The faculty, staff, and visiting guest instructors and clinicians provide the instructional material. The formal sub-courses are sponsored by the College of Dentistry. The courses are scheduled so that a postdoctoral student can complete the program within two years. All courses include a post-study evaluation by course faculty, and each postdoctoral student must successfully complete the evaluation seminar to receive credit for the course.

The College of Dentistry accepts only qualified applicants for this postdoctoral program. Applicants must be currently practicing dentistry or hold a teaching appointment, as some of the courses require patient care.

The College of Dentistry operates a special advanced dental education clinic donated in memory of the late L.M. Anderson. The clinic provides fifteen modern dental operations with ability to configure the clinic as needed. Laboratory and X-ray facilities adjacent to the clinic are available for use. This clinic is reserved specifically for advanced education for practicing dentists. A summary of continuing education programs for 1982-83 is listed in Table 48.

The University of Florida compares very well to other dental schools in the commitment of the institution to continuing education and the number of courses and students involved. UF is one of the few schools that has a full-time director of continuing education. It offers more continuing education courses than all the other schools in the southern states and all but two of the schools in the ten largest states. It also involves a large percentage of its faculty in the continuing education offerings. See Tables 49 and 50.

Departmental Structure

In January 1975, the Florida Board of Regents approved the organization of the College of Dentistry into thirteen departments:

Basic Dental Sciences
Community Dentistry
Dental Biomaterials
Dental Education
Endodontics
Occlusion and Fixed Prosthodontics
Operative Dentistry
Oral Medicine
Oral Surgery
Orthodontics
Periatric Dentistry
Periodontics
Removable Prosthodontics

TABLE 48

ANNUAL SUMMARY OF DENTAL CONTINUING EDUCATION PROGRAMS 1982-1983

PROGRAMS OFFERED	122
PROGRAMS CANCELLED *	11
NUMBER OF DENTISTS ATTENDED	1042
NUMBER OF AUXILIARIES ATTENDED	2846
NUMBER OF CLINICAL (hands-on) PROGRAMS	57
COURSES OFFERED OUT OF TOWN	49

* All courses cancelled because of insufficient numbers of pre-registrations.

Source: University of Florida College of Dentistry, 1983

TABLE 49

CONTINUING EDUCATION OFFERED AT DENTAL SCHOOLS IN THE TEN LARGEST STATES

August 1981 to July 1982

Dental School	Number of Courses Offered	Total Enrollment In Courses	Total Number of Instructors from Dental School Faculty	Total Number of Instructors from Non-Dental School Faculty	Position of Continuing Education Director	Percent of Part-Time Director's Involvement
University of Detroit	62	1,350	49	41	Part-Time	40
Northwestern University	12	582	24	19	Part-Time	5
Loyola University	6	169	4	4	Part-Time	25
Loma Linda University	74	2,785	64	34	Full-Time	-
Univ. of So. California	82	3,491	60	62	Full-Time	-
Univ. of the Pacific	62	2,744	25	41	Full-Time	-
Univ. of Pennsylvania	57	1,171	69	28	Full-Time	-
Case Western University	42	1,073	62	27	Full-Time	-
New York University	73	1,161	44	68	Part-Time	40
Columbia University	14	357	23	13	Part-Time	30
F. Dickinson University	70	1,265	21	15	Part-Time	20
New Jersey College	31	956	43	9	Full-Time	-
SUNY, Buffalo	25	1,097	15	21	Full-Time	-
SUNY, Stony Brook	3	11	7	1	Part-Time	15
Univ. of Pittsburg	110	3,921	15	75	Full-Time	-

TABLE 49 (Continued)

CONTINUING EDUCATION OFFERED AT DENTAL SCHOOLS IN THE TEN LARGEST STATES (CONT.)

August 1981 to July 1982

Dental School	Number of Courses Offered	Total Enrollment In Courses	Total Number of Instructors from Dental School Faculty	Total Number of Instructors from Non-Dental School Faculty	Position of Continuing Education Director	Percent of Part-Time Director's Involvement
Temple University	56	1,817	62	32	Part-Time	20
University of Michigan	71	3,950	97	36	Part-Time	70
Univ. of Texas, SA	61	1,890	149	44	Part-Time	60
Univ. of N. Carolina	54	2,831	110	11	Part-Time	60
Univ. of Florida	95	2,887	67	12	Full-Time	-
Ohio State University	33	1,573	38	19	Full-Time	-
Univ. of Illinois	25	441	57	14	Part-Time	40
U. of Texas, Houston	26	1,028	47	41	Part-Time	10
So. Illinois University	5	77	8	-	Part-Time	**
Univ. of California, SF	142	6,005	65	15	Full-Time	-
Univ. of California, LA	33	1,450	41	18	Part-Time	25
Baylor Col. of Dent.	26	1,118	40	28	Full-Time	-

** Position was vacant at time of reporting

TABLE 50

CONTINUING EDUCATION OFFERED AT DENTAL SCHOOLS IN THE SOUTHERN STATES

August 1981 to July 1982

Dental School	Number of Courses Offered	Total Enrollment In Courses	Total Number of Instructors from Dental School Faculty	Total Number of Instructors from Non-Dental School Faculty	Position of Continuing Education Director	Percent of Part-Time Director's Involvement
Emory University	22	832	21	12	Part-Time	50
Meharry Med. College	3	111	10	3	Part-Time	30
Univ. of Alabama	14	645	11	15	Part-Time	50
Med. U of S Carolina	19	1,012	18	12	Part-Time	70
Univ. of Tennessee	20	715	20	23	Part-Time	30
Univ. of Louisville	41	1,337	50	24	Part-Time	20
Univ. of Kentucky	60	1,506	75	14	Part-Time	50
Univ. of Maryland	57	1,290	62	17	Full-Time	-
Virginia Comm. Univ.	46	2,358	55	30	Full-Time	-
Med. Col. of Georgia	24	602	25	12	Part-Time	15
Univ. of Texas, SA	61	1,890	149	44	Part-Time	60
Univ. of N. Carolina	54	2,831	110	11	Part-Time	60
Univ. of Florida	95	2,887	67	12	Full-Time	-
West Virginia Univ.	44	1,136	37	27	Part-Time	50
U. of Texas, Houston	26	1,028	47	41	Part-Time	10

TABLE 50 (Continued)

CONTINUING EDUCATION OFFERED AT DENTAL SCHOOLS IN THE SOUTHERN STATES

August 1981 to July 1982

Dental School	Number of Courses Offered	Total Enrollment In Courses	Total Number of Instructors from Dental School Faculty	Total Number of Instructors from Non-Dental School Faculty	Position of Continuing Education Director	Percent of Part-Time Director's Involvement
Univ. of Mississippi	9	355	14	7	Full-Time	-
Louisiana St. Univ.	20	1,715	72	12	Part-Time	41
Baylor Col. of Dent.	26	1,118	40	28	Full-Time	-

Competency-Based Curriculum

The College of Dentistry curriculum is based on competencies rather than time. The curriculum allows for students to graduate when they have fulfilled the competency objectives regardless of their time of enrollment. The flexible modular curriculum provides a learning environment for students to become competent in dentistry in a self-paced manner. Self-pacing is facilitated by the use of self-instructional materials (primarily audio visual) rather than the traditional lecture series. The 1982-83 graduating class has one student who graduated in three years, twenty-one who graduated in fewer than four years, thirty-four who took four years to complete, and four students who will take longer than the traditional four years.

Patient Care

The University of Florida College of Dentistry students provide patient care through an outreach clinic, the Lafayette County Dental Health Care Center in Mayo, Florida. There have been a total of 55,536 patient visits since the inception of the clinic. Currently, there are approximately 700 new patients being seen at the clinic each month.

Fees for these dental services are charged on a sliding scale basis. The maximum charged is 20 percent above the actual cost of the service. There has been no increase in these fees for three years. For the 1983 July to December period, the clinic showed an increase of $60,000 over the same period in 1982. The largest population using the clinic services are persons in the lower middle income and low income group. These patients travel from throughout rural north-central Florida to receive care. It is believed that these are persons who would not be receiving dental care were it not for the dental outreach clinic.

Costs of Dental Education

Dentistry is considered to be the most expensive of all the health professional programs because of the low faculty/student ratio necessary for instruction in the clinic. Table 51 displays the estimated revenue sources for the College in 1982-83 which total almost $13 million. The state appropriations which relate to instruction are the first two figures: $6,012,851 direct to the college and $3,278,400 which are the indirect costs budgeted to the institution. Table 52 is an estimate of the allocation of expenditures at the College. The costs for instruction of the dental students in the professional program is estimated to be $7,845,180 or $26,867 per student.

TABLE 51

ESTIMATED
ALLOCATION OF EXPENDITURES BY PROGRAM
1982-83
COLLEGE OF DENTISTRY

	Expenditure	Percent of Total
Undergraduate Instruction	39,738	.3
Graduate Masters	422,836	3.3
DMD - Professional Degree	7,845,180	60.7
Ph.D.	80,299	.6
Other Instruction	290,548	2.2
Research	1,519,254	11.7
Patient Care	1,174,093	9.1
Other*	1,561,895	12.1
Total	12,933,843	100.0

*Includes Counseling, Professional Development, Professional Services, and Miscellaneous.

Number FTE Graduate	10**
Cost Per FTE	42,283
Number DMD Professional Students	292
Cost Per Professional Students	26,867

**Registered FTE only. Does not include an additional 10 students who are on stipends and do not enroll for tuition purposes. Therefore the cost for the 10 enrolled is distorted.

OMB/RAH: 04/28/83

TABLE 52

ESTIMATED
SOURCES OF FUNDS
1982-83
COLLEGE OF DENTISTRY

	Amount	Percent of Total
State Appropriations		
Direct to College	6,012,851	46
Indirect through Univ. & HC	3,278,400	25
Dental Clinics	1,685 .57	13
Contracts & Grants	600,829	5
Miscellaneous Gifts and Grants	181,376	2
Academic Enrichment Fund	1,175,130	9
Total	12,933,843	100

The Supply of and Demand for Dentists in Florida

The increased production of dentists nationally over the last two decades has significantly increased the dentist-to-population ratio in the United States. Florida has seen an even greater increase because the State has attracted so many dentists from around the country. In fact, Florida is the number one destination for dentists moving from one state to another. Though Florida has fewer dentists for its population than the national average, it has more than most of the other southern states.

Though no consensus can be achieved on the number of dentists needed in Florida, it is widely believed among health professionals and health manpower planners that Florida has an adequate number of dentists and many people feel that Florida has an oversupply of dentists. The Commission received considerable testimony from practitioners on the lack of business by many dentists and on the difficulty new dentists have in attracting a sufficient number of patients to support a practice.

One indication of the adequacy of the present supply of dentists is the fact that public institutions, which have suffered from a chronic shortage of health professionals, report that they are presently able to employ dentists. In fact, the HRS Department of Health and Rehabilitative Services Public Health Dental Program has announced that for the first time in recent memory, there are no vacancies for dentists in any of the institutions.

1. The supply of dentists in Florida is adequate to meet the demands of the population.

The State of Florida has had two critical areas of need in the past: rural communities and low-income inner-city populations. The Department of Health and Rehabilitative Services reports that access to dental care has improved significantly for rural communities over the last few years. While underserved areas still exist, the problem is no longer caused by an insufficient supply of dentists. Rather, such areas have not been able to attract dentists because there are not enough people in the community with the economic resources to support a dental practice. Similarly, people in the inner-city who are not receiving needed dental care simply do not have the money to pay for dental services. There is no reason to presume that increasing the overall supply of dentists will improve access for these underserved populations.

2. The problem of chronically underserved populations such as people who live in rural communities and low-income, inner-city neighborhoods cannot be addressed simply by increasing the supply of dentists.

Enrollment Level at the University of Florida College of Dentistry

Florida presently has one dental school, the University of Florida College of Dentistry, which has an entering class of 80 students. In 1981-82, the College of Dentistry enrollment was increased from 66 to 80. Though Florida has a low number of dental school slots, the majority of dentists in Florida who pass the Florida Board each year are from out-of-state. Likewise, one-third of the dentists who hold Florida licenses reside out-of-state and could move to Florida and set up practice at any time. From in-state migration and the annual

graduates from the University of Florida, the dental manpower needs of Florida are presently being adequately met. In fact, many people believe that Florida is or shortly will be entering a period of oversupply.

Reductions in enrollment are occurring or being recommended at dental schools across the country. The American Dental Association Council on Dental Education has estimated that enrollment reductions must be of an order of 20 to 25 percent to realize any significant cost savings because so many of the instructional costs are fixed. If the enrollment at the University of Florida College of Dentistry were rolled back to the 1981-82 level of 66 students in the entering class, it would represent an 18 percent reduction sufficient to achieve some cost savings and to improve the quality of education for the remaining students.

3. The needs of the State of Florida for an adequate number of dentists can be met with the University of Florida College of Dentistry reducing its entering class enrollment by 14 students or 18 percent.

The last few years have seen a considerable expansion across the country in dental general practice residencies (GPRs). These one-year residencies are taken by dental students immediately upon graduation usually in a teaching hospital. The resident receives a stipend from the hospital and practices there but is also under the supervision of a faculty member and attends seminars and lectures.

Increasingly, graduates of dental schools are reporting a need to develop their clinical skills beyond the level permitted in a four year curriculum. The University of Florida presently has six GPR slots for which there were 76 applicants in 1983.

4. The University of Florida College of Dentistry should consider expanding the number of general practice residencies.

Access to Dental Education

Florida has considerably fewer slots available in-state for citizens who seek dental education than most other states. The national ratio is 2.69 slots per 100,000 population. Florida's ratio is 0.67 or only one-fourth of the national average. Prior to the academic year 1982-83, Florida residents could pursue dental education at Emory in Atlanta at in-state tuition rates through a Southern Regional Education Program (SREB) compact agreement. In 1981-82, forty-nine Florida residents pursued this option, in 1982-83, twenty Florida residents participated in the program. It has now been discontinued. In 1982-83, thirty-nine Florida residents (in addition to the twenty at Emory) attended dental schools in other states.

On the surface, this may appear to warrant additional access for in-state students. Public policy regarding access to education is substantially different in areas of professional preparation than in undergraduate education. Dental education is a narrow and highly-specific field of training and skills acquired are not transferable to other occupations or endeavors. It is also a very costly program requiring expensive equipment and an extremely low faculty-student ratio. A State's responsibility to provide equitable access for citizens wishing to pursue dental education must be balanced against the State's need for dental manpower and competing State priorities for funding. The State

should not expand access to dental education only as a response to student demand when the best information available indicates that the demand for dental services does not justify additional dentists.

5. The State of Florida is presently adequately meeting its obligation to provide access to dental education for its citizens.

Mission of the University of Florida College of Dentistry

The University of Florida College of Dentistry is moving into its second decade. The College should now consider re-examining its mission with an increased emphasis on establishing excellence in dental research. The College is one of the newest in the country and is widely considered one of the finest in the South. It should strive to attain national prominence in its research efforts, both basic and applied. The College should strive to become a national leader in research endeavors which may most benefit Florida's elderly population.

6. The University of Florida College of Dentistry should reassess its mission and consider giving greater emphasis to establishing a strong research component, particularly in the areas of geriatrics and gerontology.

Tuition Level and Student Indebtedness

Tuition and fees at the UF Dental School are $2,037.00 per 12 months, slightly below the mean at other public schools in the south and significantly below the mean at the public schools in the ten largest states. Public school tuition has increased 252 percent in the past ten years. Student indebtedness has also increased significantly. Indebtedness for students at public dental schools is now at $17,000 and is expected to double in the near future for many students. A drop has already been registered in the number of lower middle-income students applying to dental schools.

In the Commission's recommendations on tuition and financial aid, the Commission established the policy that both the State and the student should bear an equitable portion of the financial burden. At present, in-state dental students pay approximately 8 percent of the costs of their education. This is substantially less than the share paid by community college and undergraduate university students. In addition, dental graduates are likely to maintain an income considerably higher than the public-at-large. At present, the income level of dentists is in the top four percent nationally.

The Commission recommends that in-state dental school tuition and fees be raised to $4,000.00 to bring the share of the costs of education in line with undergraduate education. Further increases should not be pursued until the impact of this raise on the mix of applicants is determined. The question of access for low-income or minority students should be addressed through financial aid programs.

7. Tuition and fees at the University of Florida College of Dentistry should be raised to $4,000 per year or roughly 15 percent of instructional costs. The increase should be phased in over a two-year period. For Fall 1985 the tuition and fees should be raised to $3,000 and for Fall 1986, the tuition and fees should be raised to $4,000.

State Financial Aid Programs or Service Commitments

Between 1955 and 1968 the State of Florida offered stipends to dental students who at that time pursued dental education outside the State. The student could either pay back the loan at what was at that time a stiff interest rate (eight percent) or provide service to the State by (1) setting up practice in an underserved area or (2) being employed at public institutions such as a mental institution, Sunland center or other. The program was discontinued in 1969 when the Legislature determined that the program had largely served its purpose.

While the dental care needs of certain populations are still not being met, the Commission does not feel that the establishment of a service commitment financial aid program would help address the needs. Most of the geographical areas presently underserved do not have the resources to support additional dental manpower and the State would be placing a burden on a student by requiring that he or she set up practice in such an area. Moveover, the supply of dentists is such that public institutions are now able to meet their staffing needs.

8. At this point, the remaining problems of maldistribution of dental manpower cannot be addressed through the educational system.

Dental Needs of the Elderly

The dental needs of the elderly are of prime concern to Florida. Florida is the oldest state in the nation as measured by the median age of the populace. It has the highest percentage of persons aged 65 and over in the nation and in 20 years will have the greatest absolute number of elderly persons. The considerable anticipated growth in the Florida population will be among older persons. These persons aged 35 and older are projected to account for three-fourths of the state's population increase between now and the end of the century. The dental needs of older people are considerably different from those of younger people. For example, by age 35 the average American has lost five teeth. Periodontal disease is the most common cause of tooth loss in persons over 35 years of age. Advanced periodontal disease exists among 37 percent of adults 45 to 64 and 50 percent of persons aged 65 to 74. Also, the dental needs of elderly people are changing. It is possible that the effect of lifetime exposure to fluoridization may decrease the prevalence of periodontal disease. Likewise, it is anticipated that the loss of teeth by the elderly will decrease gradually. The mix of dental services needed may be changing. As a larger percentage of people retain their teeth into old age, demand for preventive, restorative, periodontic, endodontic and fixed prosthetic services may increase while demand for extractions and removable prostheses may decrease. Elderly individuals confined to nursing homes or homebound are less likely to travel to dental offices than people who are mobile. Proper preventive care (flossing and brushing) becomes more difficult and access to professional dental care is impaired. Approximately 1.3 million persons are in nursing homes representing at any one time about five percent of the population. Of those, 60 percent or more have immediate dental needs, with their last visit to the dentist occurring six years ago and the average age of their dentures exceeding ten years. The oral health problems of the elderly and chronically ill or disabled in nursing homes are considered to be far more serious than oral health problems among the rest of the population, including the elderly outside nursing facilities.

The College of Dentistry has recently appointed a new dean, Dr. Donald Legler, who has considerable expertise in the areas of geriatrics and gerontology. Under his leadership, the College of Dentistry administrators and faculty should assess the needs of the elderly for dental care on an ongoing basis and ensure that clinical and didactic instruction includes scientifically-based knowledge and clinical experience concerning the elderly. Topics such as periodontal disease, endodontics, replacement restorations and management of secondary and root caries should be emphasized. Access to older patients should be pursued through out-reach programs such as those presently being developed in Jacksonville and St. Petersburg. Externships should be offered in nursing homes. Faculty professional development should be instigated to assure that faculty are current in the research, instruction and public service implications of the increasing numbers of the elderly. In conjunction with the Florida Dental Association, the needs of practicing dentists for professional continuing education on the dental needs of the elderly should be addressed and appropriate instruction offered.

The University of Florida College of Dentistry is one of the newest colleges in the country and has already distinguished itself in a number of instructional and research areas. With the appointment of a new dean, it has the opportunity to establish national prominence in the area of dental care for the elderly.

9. The University of Florida College of Dentistry should consider designating geriatric dentistry as a top priority for research and instruction.

Continuing Education

The recent American Dental Association Study on the Future of Dentistry highlighted the importance of the effective transfer of new knowledge and techniques to practicing dentists and, in particular, recommended the expansion of the role of dental schools in improving the transfer to the practicing profession. The Commission recognizes the strong commitment of the UF College of Dentistry to helping the practicing dentists in Florida keep abreast of professional, scientific and technical advances in the profession.

10. The University of Florida College of Dentistry should continue its service to the State by offering continuing education courses throughout the State. The dental needs of the elderly should be of the highest priority. Clinical instruction should be offerred utilizing the faculty and equipment of the college.

Public Health Dentistry in Florida

The Department of Health and Rehabilitative Services in conjunction with the local county health departments delivers direct dental care, preventive dental care and dental care prevention education to underserved populations throughout Florida.

11. The clinical and research faculty of the College of Dentistry should work closely with the Department of Health and Rehabilitative Services Public Health Dental Program to improve the delivery of direct care and preventive and educational services to the targeted populations. More research is needed on the role of the dental hygienist, in particular, in the delivery of direct care in community settings.

12. The planned College of Public Health at USF should review the curriculum of the Master's in Public Health to establish the appropriate role of public health dentistry in the curriculum. Because public health personnel tend primarily to be physicians and nurses, it is important that the dental health needs of communities be presented in the professional degree program.

Graduates of Foreign Dental Schools and Licensure in Florida

Concern has been expressed over the large number of dentists who are trained in foreign dental schools and who seek licensure in Florida. Florida is one of only 17 states (and the only one in the South) that does not require additional education for foreign graduates in a U.S. dental school. Foreign graduates are required to have completed the National Board of Dental Examiners Written Examination or National Board Equivalency Written Examination and to complete a mannequin examination administered by the Florida Board. Currently, no examination of the educational process the student underwent is required. If the student can pass these two exams, he or she will be allowed to practice in Florida. The Department of Professional Regulation has recently submitted to the Legislature a review of the licensure process for residents who have graduated from foreign professional schools. The report recommends the establishment of a Foreign Graduate Clearing House which would be responsible for on-site reviews of any non-accredited foreign institutions whose graduates wish to obtain licensure in Florida. The institution would bear the cost of the on-site inspection and any further visits that might be required to assure compliance with established standards.

The Commission agrees with the direction taken in the report stressing that the process of education received by a candidate for licensure from an unaccredited institution must be subject to examination by the State to include a review of the curriculum, faculty and facilities of non-accredited schools. Other states, New York in particular, are presently developing their own review process. Florida might wish to join with other states faced with large numbers of candidates from foreign schools and develop program review criteria in consort. To address both the responsibility of the State to maintain the highest levels of professional standards and the rights of Florida residents to pursue a livelihood for which they are trained, proper review procedures must be established.

13. The State of Florida should develop a program review process and criteria to evaluate the adequacy of training received by graduates of unaccredited dental schools who present themselves for licensure in Florida and students in unaccredited schools who seek to obtain clinical internships in institutions in Florida.

VIII. DENTAL HYGIENISTS AND DENTAL HYGIENE EDUCATION IN FLORIDA

Dental Hygiene Profession

The dental hygiene profession emerged in the early part of the twentieth century in response to dentists' beliefs in preventive dentistry. The basic preventive functions of the hygienist have evolved with the increase in knowledge of the causes and prevention of dental disease and with developments in the technology of dental equipment and products. Hygienists provide educational, preventive and therapeutic services directly to the patient but, according to state dental practice acts, they must work under the supervision of a dentist. The hygienists' responsibilities vary among states but may include taking medical and dental histories, taking X-rays, removing scale from teeth, applying topical fluoride, making impressions of teeth for study models and preparing other diagnostic aids. In some states, dental hygienists may also provide educational programs and faculty and staff training programs in schools and organizations. The majority of dental hygienists are female and are relatively young. In fact, over half are under 30 years of age and over 80 percent are under 40. Close to one-third hold a baccalaureate degree and about two-thirds hold an associate degree. A hygienist may see six to ten patients on a typical day. Half of the hygienists earn less than $15,000 before taxes. Fifteen percent reported before-tax earnings between $20,000 and $30,000. The average wage for Florida dental hygienists is $6.07 per hour.

Expanded Function Dental Auxiliaries

Research conducted during the 1960s and 1970s examined the feasibility of delegating certain expanded functions to dental hygienists. These research projects were initiated from concern that demand for dental services would exceed the capabilities of the profession. Expanded utilization of hygienists could increase productivity and the research showed that with expanded function training, hygienists could perform as well as dentists on the tasks learned. A majority of state practice acts were revised to allow dental hygienists (and assistants) to perform expanded functions under the direct, indirect, or general supervision of a dentist and after additional formal or on-the-job training.

Most states continue to restrict hygienists and assistants to performing functions deemed "reversible." The states vary in whom they permit to perform certain functions, required training, required registration and licensure, and the scope of tasks allowed.

Licensure

Dental hygienists must be licensed in all fifty states. State boards of dentistry including Florida regulate the traditional and expanded functions a hygienist is permitted to perform.

Utilization of Dental Hygienists

During the past several decades, as dentists received training in dental hygienist utilization, as revisions in state dental acts permitted hygienists to perform additional functions and as demand for services increased, the utilization of dental hygienists grew markedly. In 1955, only 10 percent of

dentists employed hygienists. Today over half have hygienists on their staff. However, because some dental practices are underutilized, some dentists are performing procedures previously delegated. As a result, the demand for hygienists may decline in some areas.

As dental practices increasingly treat the well patient and as the public's interest in prevention and improved general health increases, the role of the dental hygienist may be expanded to assume more patient education and counseling activities. Overall, however, the number of dental hygienists and the procedures which they perform in both public and private settings are not expected to change significantly within the next decade.

Employment Opportunities

Though most dental hygienists are employed by dentists in private practice, other career opportunities exist such as sales and marketing of dental products, public health, overseas opportunities and hospital dentistry.

Job Dissatisfaction and Turnover

Many hygienists currently believe that their career growth is limited. Unsuccessful attempts have been made to change state practice acts to permit hygienists to act independently of a dentist. Opportunities for career advancement, the amount of satisfaction gained from working in a dental office and the level of compensation are cited as factors in job dissatisfaction and high turnover.

Education of Dental Hygienists

The first formal dental hygiene program was established in 1910 and the number of programs increased slowly until the mid-sixties. Between 1966 and 1979, the number of programs increased rapidly from around 50 to 200.

To be accredited, a program must be at least two years in length and conducted at the postsecondary level. In October 1982, there were 202 accredited dental hygiene programs in the country. The awards granted for dental hygiene programs are primarily certificate, A.S., and A.A.S. degrees. Some institutions offer diplomas, A.A. degrees, and B.S. degrees. Minimum educational requirements for entrance range from a high school diploma to one or two years of college. Thirty-seven programs or 18 percent are baccalaureate degree programs. Institutions offering dental hygiene programs include public and independent technical schools, community colleges, four-year colleges and universities.

Number of Programs

During the first year in which the Council on Dental Education conducted accreditation (1961), there were 37 accredited dental hygiene programs. As of 1982, that number had grown to 202 programs. The number of dental hygiene programs tripled during the 1960s. Expansion continued in the 1970s although at a somewhat slower rate. In 1970 there were 102 dental hygiene programs and by 1980 there were 200 programs. Texas has 14 programs, California 13, and New York 11. Florida has eight programs.

Program growth in the last 20 years is attributed to a number of factors, the most significant being availability of federal and state funds, the commitment of community colleges to development of allied health training programs and the growth of the needs of the dental profession for trained dental hygienists.

There has been a significant slow-down in development of new programs in the last four years. The number of dental hygiene programs has increased by only five. Given program distribution, the scarcity of financial resources for program development and an apparent drop in the applicant pool, it is unlikely that there will be demand for additional growth in the number of programs.

Enrollment Levels

In 1982, there were 5,208 students enrolled in dental hygiene programs. Enrollments peaked in 1978 and have been declining at increasing rates for the last five years. In the last ten years, the accredited programs have produced approximately 44,000 dental hygienists. The 4,818 students who graduated from dental hygiene programs in 1982 represented a five percent decrease over the previous year. Of almost 5,000 graduates in 1982, almost 15 percent were awarded baccalaureate degrees, 71 percent associate degrees and 14 percent diplomas or certificates. Nationally, there are 2.41 slots in dental hygiene programs per 100,000 population. This compares to 5.07 in Florida.

Dental Hygiene Education in Florida

Dental hygiene programs are offered at eight public community colleges in Florida. See Table 53. The programs are approximately two years in length, require a high school diploma or GED for admission, and award an Associate of Science (A.S.) degree. The State of Florida has no private dental hygiene program nor does it have any baccalaureate or master's programs in dental hygiene. The curriculum includes general education courses; basic science courses such as chemistry, microbiology, anatomy; social sciences such as sociology and psychology; and didactic and clinical instruction in the technical areas. The program is one of the more expensive Associate of Science programs because of the equipment needed and the close supervision required in the clinic. The admission requirements are competitive and the programs are limited access programs.

Distribution of Programs

Table 54 shows the distribution of programs and students in the State. Each region has at least one program. The two northern regions, the Panhandle and the Crown, have a disproportionately large share of the number of programs and students while the East and West Central regions have a disproportionately small share. The South has a number of programs and students proportionate to its share of the State's population.

Enrollment Levels

Enrollments in dental hygiene have been decreasing in Florida as they have nationally. In 1979-80, 624 students were enrolled. This figure has declined by almost 100 in 1981-82. Enrollments have declined in every region except the Crown and West Central regions since 1975-76. Enrollments in the Panhandle have declined almost by half since 1975-76. See Table 55.

TABLE 53

DENTAL HYGIENE PROGRAMS IN FLORIDA

FALL 1983

School	Capacity of Program Per Class	Fall 1983 Enrollment	Credit Hours Required
Pensacola JC	34	24	93
Tallahassee CC	24	16	72
Florida Jr. College at Jax	22	22	100
Santa Fe CC	24	24	88
Valencia CC	24	27	75
St. Petersburg CC	34	34	93
Palm Beach JC	40	40	74
Miami-Dade CC	49	49	95

Source: Survey of Directors of Programs, PEPC Staff, 1984

TABLE 54

DENTAL HYGIENE PROGRAMS IN FLORIDA BY REGION 1981-1982

Region	Number of Programs	Enrollment		Completions		Percent of State Population
		Number	Percent	Number	Percent	
Panhandle	2	118	22.4	53	24.1	8.8%
Crown	2	124	23.6	41	18.6	13.0%
East Central	1	27	5.1	21	9.5	15.7%
West Central	1	97	18.4	29	13.2	27.1%
South	2	160	30.4	76	34.6	35.4%
STATE	8	526		220		100.0%

Source: Florida Department of Education, Division of Community Colleges, MIS, 1983.

TABLE 55

ENROLLMENT IN DENTAL HYGIENE PROGRAMS BY REGION BETWEEN
1975-76 AND 1981-82

Region	75-76	76-77	77-78	78-79	79-80	80-81	81-82
Panhandle	217	179	105	170	149	136	118
Crown	33	38	110	115	126	134	124
East Central	0	25	47	45	121	44	27
West Central	63	68	61	67	82	64	97
South	239	212	131	148	146	175	160
STATE	552	522	454	545	624	553	526

Source: Florida Department of Education, Division of Community Colleges, MIS, 1983.

Some of the dental hygiene programs have decreased their capacity. Pensacola Junior College had an original capacity of 50 students; it has been reduced to 34. Two of the programs were not fully enrolled in 1983-84: Pensacola Junior College and Tallahassee Community College. There were 16 more openings than there were qualified applicants. See Table 53.

Length of Program

Considerable concern has been expressed over the lengthening of the dental hygiene curriculum. At some schools, the length of time necessary to complete the program is almost three years. The major reason cited for the increase is the expanded functions which require additional instruction. At present, the number of credit hours required for completion of the program ranges from 72 to 100. See Table 53.

The dental hygiene program is a difficult and rigorous course of instruction and only highly qualified and motivated students are successful. Educators are reporting higher attrition rates because students are not sufficiently prepared prior to beginning the program. Educators fear that this combined with the length of time required, the fact that students emerge without college credit hours that are protected if they wish to pursue a four-year degree, and the low job satisfaction experienced by many hygienists will result in even further enrollment drops. Increasingly, for many students, the length and rigor of the education may not be worth the job conditions. The academically successful and highly motivated student may be selecting other career training paths that offer rewards deemed more commensurate with the demands of the training.

Costs of Dental Hygiene Education

Dental hygiene programs are considered to be one of the most expensive of all allied health programs. The American Dental Association cost study for 1981 reports the national average total cost per student per year to be $5811. The perponderance of the cost comes from the dental hygiene part of the curriculum which accounts for $4907. The basic sciences account for $571 and general education for $391. The seven Florida programs that are included in the study have costs significantly below the national average. The average total costs per student for 1981 for the Florida programs is $4476, twenty-three percent lower than the national average. Of the seven Florida programs, the costs ranged from $5572 for the most expensive program and $3426 for the least expensive.

The Supply of and Demand for Dental Hygienists in Florida

Projected employment for dental hygienists between 1984 and 1989 is 3,647 to 4,773 positions with 225 annual openings. See Table 56. For the last three years, the eight dental hygiene programs have produced between 220 and 231 dental hygienists a year. In addition, between 50 and 100 hygienists from out-of-state successfully pass the Florida dental hygienist licensure exam each year. See Table 57. Moreover, though 324 students completed the program in 1980-81, only 125 were placed, that is to say only slightly more than half.

Given the facts that between new graduates and in-migration the annual anticipated openings are being more than adequately met and enrollments are

TABLE 56

PROJECTED EMPLOYMENT IN
DENTAL HYGIENE BY REGION
1984-89

Region	Employment		Annual Average[a] Openings
	1984	1989	
Panhandle	284	365	16
Crown	393	500	21
East Central	542	711	34
West Central	1028	1401	75
South	1400	1796	79
State	3647	4773	225

a/ Derived by Postsecondary Education Planning Commission staff.

Source: Florida Occupational Information System, 1983

TABLE 57

FLORIDA STATE BOARD OF DENTISTRY APPLICANTS
FOR DENTAL HYGIENE LICENSURE
(NUMBER PASSING IN-STATE COLLEGE AND OUT-OF-STATE COLLEGE GRADUATES
FOR EACH EXAM)

	1981	1982	1983
Number Passing In-State (Schools)	199	139	187
Number Passing Out-Of-State (Schools)	157	124	163

Source: Florida Board of Dentistry, 1984

declining, it can be concluded that the present capacity for educating dental hygienists in the State should not be increased.

Comparing the number of students completing programs to the number of annual average openings shows the two Panhandle programs are producing two or three times the number of students needed to fill anticipated openings. The East Central region produced about two-thirds of the number needed and the West Central region is graduating less than half, but with in-state migration and intrastate mobility, that should be sufficient. The South shows the number of completers equal to the number needed. See Table 58. However, because dental hygiene students display considerable mobility both in selecting an institution to attend and in selecting a location to practice, regional supply and demand comparisons may not fully account for all students.

Minorities in Dental Hygiene Programs

Blacks are poorly represented in dental hygiene enrollments and completions. Though blacks constitute 13.8 percent of the State's population, only 1.3 percent of the enrollees are black and only 0.5 percent of the completers are black. Students of Spanish origin are better represented in that they constitute 5.1 percent of enrollees and 6.8 percent of completers. See Table 59.

Placement By Program

Placement as a percentage of completion for the eight programs is displayed on Table 60. On a statewide average, 63 percent of the completers were placed in dental hygiene occupations.

Licensure Examination Passing Rates by Program

The following chart describes the passing and failure rates of graduates of the dental hygiene programs in Florida for the last June and December administrations. The passing rates for June 1983 range from a low of 58.1 percent at Pensacola Junior College and a high of 95.0 percent at Santa Fe Community College. The State average is 80.4 percent. See Table 61.

TABLE 58

PROJECTED ANNUAL AVERAGE OPENINGS
AND NUMBER OF STUDENTS COMPLETING AND PLACED
BY REGION

Region	Annual Average Openings 1984-89	Number Completing 1981-82	Number Placed 1981-82
Panhandle	16	53	35
Crown	21	41	34
East Central	34	21	18
West Central	75	29	18
South	79	76	34
State	225	220	139

Source: Florida Occupational Information System and Department of Education, Divisions of Community College and Vocational Education, 1983

TABLE 59

FLORIDA POPULATION VS ENROLLMENT AND COMPLETION PERCENTAGES
BY RACE OR ETHNICITY FOR DENTAL HYGIENE
1981-1982

Race or Ethnicity	Percent of State Population	Percent of Enrollments	Percent of Completions
White	84.0	92.8	91.8
Black	13.8	1.3	0.5
Spanish Origin	8.8	5.1	6.8

Source: U.S. Bureau of the Census, PHC80-V-11. Florida Department of Education, Division of Community Colleges, MIS, 1983.

TABLE 60

PLACEMENT AS A PERCENTAGE OF
COMPLETION IN DENTAL HYGIENE PROGRAMS
BY REGION
1981-82

Region	Number of Completers	Number Placed In Field	Percentage of Completers Placed
Panhandle	53	35	66.0
Crown	41	34	82.9
East Central	21	18	85.7
West Central	29	18	62.1
South	76	34	44.7
State	220	139	63.2

TABLE 61

DENTAL HYGIENE EXAM

FLORIDA BOARD OF DENTISTRY
June and December 1983

	Passed		Failed		Total	
	Number	Percentage	Number	Percentage	Number	Percentage
Florida Junior College	27	71.1	11	28.9	38	8.9
Miami-Dade CC	66	93.0	5	7.0	71	16.6
Palm Beach	65	82.3	14	17.7	79	18.5
Pensacola	25	58.1	18	41.9	43	10.0
St. Petersburg	51	76.1	16	23.9	67	15.7
Santa Fe	38	95.0	2	5.0	40	9.3
Tallahassee	36	72.0	14	28.0	50	11.7
Valencia	36	90.0	4	10.0	40	9.3
Total in State Schools	344	80.4	84	19.6	428	100.0

Source: Department of Professional Regulation Board of Dentistry Exam Statistics, July and December 1983

RECOMMENDATIONS

Supply and Demand

Florida has eight dental hygiene programs in its public community colleges. After considerable expansion in the number of programs and students over the last twenty years, the State has recently experienced a stabilizing and even a slight decline in student demand and enrollment. Projected employment opportunities for the State indicate that projected demand will be adequately met at present enrollment and completion rates and by in-migration of trained professionals from other states.

14. The State should not expand the number of dental hygiene programs.

15. If student demand continues to drop for dental hygiene programs, consideration should be given to enrollment reductions or possible termination.

The number of students and the need for trained professionals vary somewhat by region. Consideration for expansion or reduction in enrollments must be reviewed at the regional level.

16. If need can be substantiated in the future, priority should be given to expanding existing dental hygiene programs in the East and West Central regions.

Placement Standards

The placement rates for dental hygiene programs vary considerably among institutions. The State Board of Education has recently adopted a 60 percent placement standard for all public postsecondary vocational programs. The Commission is proposing that all programs that do not achieve a 75 percent placement rate should be reviewed.

17. Dental hygiene programs which have placement rates less than the 60 percent standard adopted by the State Board of Education should be reviewed by the State Board of Community Colleges for possible adjustment or termination. The placement standard should be revised to 75 percent during the second five-year cycle of program reviews by the State Board of Community Colleges.

Improved Information Collection

As the placement information becomes more central to statewide policy analysis, it becomes more important that the enrollment, completion, and placement information be as accurate as possible. One way to improve the information is to involve the program directors more closely in the collection and reporting of the information.

18. The dental hygiene program directors should be more directly involved in the collection and reporting of program information.

Program Level

The Commission's report on vocational education has drawn attention to the need to differentiate more finely between Associate of Science programs and certificate programs.

19. The practice of awarding Associate of Science degrees to students in dental assisting and dental laboratory technology programs should be reviewed by the State Board for Vocational Education. The Board should develop guidelines to determine when a field of study has reached a level requiring more technical complexity and more general education making an Associate of Science program more suitable than a certificate program.

Length of Curriculum

The lengthening of the time required for training in all allied health programs and the inflation in the degree required for job-entry is of concern to educators throughout the country.

20. The disparity in the number of credit hours required for graduation from dental hygiene programs should be reviewed by the State Board of Community Colleges, particularly in light of concern over the length of the curriculum. Greater consistency statewide should be required. Systemwide policy should be developed for the conversion of clinical hours into credit hours.

Licensure Passing Rates

The licensure passing rates of dental hygiene programs are an important measure of the quality of education received and the State should monitor the passing rates of dental hygiene program completers.

21. The State Board of Community Colleges should develop standards for licensure passing. Programs failing to meet the standards should be targeted for program review and possible termination.

Minorities in Dental Hygiene Education

The low number of minorities, especially blacks, who enter and complete health profession training programs, is of considerable concern because of the low health status of many minority populations.

22. The State Board of Community Colleges should make sure that dental hygiene programs are included in the efforts to achieve eight percent Black enrollments in allied health programs. Closer ties should be developed between minority students and minority practitioners in the field.

IX. DENTAL ASSISTING AND DENTAL ASSISTING EDUCATION IN FLORIDA

Dental Assisting

Dental assisting originated in the late 1800s when the first women were trained in dental offices to carry out secretarial duties, receive patients, and prepare dental materials. This role was characteristic of dental assisting until the concepts of "four-handed, sit-down" dentistry gained acceptance in the 1950s. Dental assistants now perform a variety of laboratory, clinical and office duties. Assistants support and deliver dental services in the general areas of operatory chairside assisting, education, reception and secretarial, and dental laboratory work. Tasks usually performed by dental assistants include preparing the operatory and the patient, transferring instruments during dental procedures, sterilizing instruments and preparing dental materials. They may also manage the office, arrange appointments, keep treatment records, send bills and order dental supplies and materials.

The employment of dental assistants by dentists has risen from 77 percent of dentists employing at least one assistant in 1961 to 87 percent of dentists employing assistants in 1981. The average number of dental assistants employed in a private practice in 1981 was 1.22. Dentists utilize auxiliary personnel to increase the productivity and efficiency of the dental practice. Most dental assistants work in private dental offices and learn their skills on the job.

Dentists' policies with respect to assistant's salaries vary widely, but there is conflicting evidence whether individuals who have completed a formal training program in dental assisting command higher pay. In 1980, most dental assistants working for dentists in private practice earned between $9,000 and $11,000 annually.

Expanded Function Dental Assistants

Most state practice acts allow dental assistants to perform expanded functions under the supervision of a dentist. Research has shown that certain dental functions can be competently performed by the assistant if given proper supervision and training (formal and on-the-job) and that the productivity of a dental practice could be improved. The training requirements for the performance of expanded functions are the same for dental assistants and dental hygienists. The required supervision of dental assistants when performing expanded functions is more direct than the supervision required of hygienists.

Licensure

Dental assistants are not required to be certified or complete a formal training program to perform expanded functions. However, four states now conduct registration programs for dental assistants and the Commission on Dental Accreditation conducts an accreditation program.

Utilization of Dental Assistants

The utilization of dental assistants has grown as dentists have gained expertise in dental auxiliary utilization and state dental acts have expanded the functions dental assistants are permitted to perform. Seventy percent of

dentists employed dental assistants in 1955 and, in 1981, almost ninety percent were employing dental assistants. Thirty percent of the general practitioners who employed at least one assistant in 1979 employed an assistant who graduated from an accredited program that taught expanded duties. Economic pressures, however, have affected the amount of task delegation to dental auxiliaries and the demand for dental assistants may be declining somewhat.

Education of Dental Assistants

The dental assisting accreditation program began in 1960. In 1961, there were 29 accredited dental assisting programs and by 1981 that number had grown to 291. Dental assisting program expansion was most rapid in the 1960s, when the number of programs quadrupled. Expansion continued in the 70s at a slower rate and the number of programs are now in decline. In 1980, there were some 548 dental assisting programs in operation.

Most dental assisting programs are a year in length and award a certificate upon successful completion. A few programs, longer in length, award an A.S. or A.A. degree. The minimum education requirement for entrance is a high school diploma or GED. Institutions offering dental assisting programs include public and independent technical schools, community colleges, four-year colleges and universities.

Enrollment Levels

In 1982, there were 7,354 students enrolled in dental assisting programs. Enrollment peaked in 1979 and has been declining at increasing rates for the last four years. In the last ten years, the accredited programs have produced approximately 57,000 dental assistants. 5,696 students graduated from dental assisting programs in 1982, a three percent decrease from the previous year.

Dental Assisting Education in Florida

Twenty-four dental assisting programs were offered in Florida in 1983. Nine are offered at public community colleges, seven at public area vocational-technical schools and eight at proprietary schools. See Table 62. The public programs are approximately one year in length and award a certificate. Some community colleges offer a two-year program for an A.S. degree. Proprietary schools may offer a diploma in dental assisting. A high school diploma or GED is required for admission.

The curriculum includes an introduction to practice; basic human anatomy, physiology, and microbiology; didactic and clinical instruction in the technical areas; and office management.

Distribution of Programs

Table 63 shows the distribution of programs and students in the State. Each region has at least two public programs. Six of the eight proprietary schools are located in the South and one each is in the East and West Central regions.

TABLE 62

FLORIDA DENTAL ASSISTING PROGRAMS
1983

COMMUNITY COLLEGE	COUNTY
Brevard Community College	Brevard
Broward Community College	Broward
Daytona Beach Community College	Volusia
Florida Junior College at Jacksonville	Duval
Gulf Coast Community College	Bay
Indian River Community College	St. Lucie
Palm Beach Junior College	Palm Beach
Pensacola Junior College	Escambia
Santa Fe Community College	Alachua
VOCATIONAL-TECHNICAL	
Charlotte Vocational-Technical Center*	Charlotte
Erwin Area Vocational-Technical Center*	Hillsborough
Lindsey Hopkins Technical Education Center	Dade
Manatee Area Vocational Technical Center	Manatee
Orlando Vocational-Technical Center	Orange
Robert Morgan Vocational-Technical Institute*	Dade
St. Pete Vocational-Technical Institute	Pinellas
PROPRIETARY	
Florida Career College*	Dade
Florida College of Medical and Dental Care*	Broward
Florida College of Medical and Dental Care*	Duval
Florida College of Medical and Dental Care*	Hillsborough
Ft. Lauderdale School of Allied Health Careers*	Broward
Keiser School*	Broward
Miami Technical Institute *	Dade
Southern College	Orange

* Not accredited by the ADA Council on Dental Education

TABLE 63

DENTAL ASSISTING PROGRAMS IN FLORIDA
BY REGION
1981-82

Region	No. of Programs	Enrollment No.	Enrollment Percent	Completions No.	Completions Percent	Percent of State Population
Panhandle	2	74	4.9%	34	8.6%	8.8%
Crown	4	185	12.4%	48	12.2%	13.0%
East Central	5	204	13.6%	47	13.0%	15.7%
West Central	4	446	29.9%	101	25.7%	27.1%
South	8	585	39.2%	199	40.5%	35.4%
State	23	1,494		396		100.0%

Source: Florida Department of Education, Divisions of Vocational Education and Community Colleges, and Florida Occupational Information System, 1983

Enrollments in Dental Assisting

Enrollments are approximately proportional to regional populations. In fact, the match is extremely close, varying by only a few percentage points in all regions. The distribution of enrollment by sector reveals that 651 or 44 percent of the students are in the school district programs, almost forty percent or 580 are in proprietary programs and 263 or 17 percent are in community college programs. See Table 64.

Completions in Dental Assisting

Completions are also proportional to regional populations. The South has a somewhat higher percentage of completers than it does of the total State population: 40.5 percent of the completions as compared to 35.4 percent of the State's population. By sector, the school districts are responsible for 15 percent of the completions, the community colleges 31 percent, and proprietary schools 56 percent. See Table 65.

Enrollment Trends

Enrollment levels in public dental assisting programs in Florida have vacillated between 700 and 1,000 for the last seven years. The last year recorded a 20 percent drop from 1,145 to 910. See Table 66.

The Supply of and Demand for Dental Assistants in Florida

The average annual openings for employment in dental assisting for the five years between 1984 and 1989 are expected to be 508. See Table 67. The most recent information available on completion and placement of dental assisting students indicates that 393 students completed programs in 1981-82 and 298 found employment in that field. Thus, the State's public and proprietary programs are presently producing about 77 percent of projected demand. Of those that complete a program, about 76 percent are being placed. With in-state migration, one may conclude that the present production is adequate to meet the State's needs. In addition, given that only 76 percent of those completing are being placed, there is little reason to consider increasing enrollment levels until those already trained are finding employment. See Table 68.

On a regional level, supply is well balanced with demand except in the West Central where 169 annual openings are predicted but total completions number only 101. However, since even fewer are being placed, increased capacity is not a current need. In the South, slightly less students are completing the program than there are openings, 159 completions to 178 openings and only 123 are being placed. See Table 68.

TABLE 64

ENROLLMENTS IN DENTAL ASSISTING
1981-82

Region	Public		Proprietary	Total Enrollments	Percent of Total Enrollments	Percent of State Population
	School Districts	Community Colleges				
Panhandle	-	74	-	74	4.9%	8.8%
Crown	-	49	136	185	12.4%	13.0%
East Central	107	63	34	204	13.6%	15.7%
West Central	285	-	161	446	29.9%	27.1%
South	264	72	249	585	39.1%	35.4%
State	656	258	580	1,494		100.0%

Source: Florida Department of Education, Divisions of Vocational Education and Community Colleges, and Florida Occupational Information System, 1983

TABLE 65

COMPLETIONS IN DENTAL ASSISTING
1981-1982

Region	Completions			Total Completions	Percent of Total Completions	Percent of State Population
	Public		Proprietary			
	School Districts	Community College				
Panhandle	-	34	-	34	8.7%	8.8%
Crown	-	25	23	48	12.2%	13.0%
East Central	13	34	4	51	13.0%	15.7%
West Central	21	-	80	101	25.7%	27.1%
South	25	27	107	159	40.4%	35.4%
State	59	120	214	393	100.0%	100.0%

Source: Florida Department of Education, Divisions of Vocational Education and Community Colleges, and Florida Occupational Information System, 1983

TABLE 66

ENROLLMENTS IN PUBLIC DENTAL ASSISTING PROGRAMS IN FLORIDA BETWEEN 1975-76 AND 1981-1982

Region	1975-76 Sch. Dist.	1975-76 Comm. Col.	1975-76 Total	1976-77 Sch. Dist.	1976-77 Comm. Col.	1976-77 Total	1977-78 Sch. Dist.	1977-78 Comm. Col.	1977-78 Total	1978-79 Sch. Dist.	1978-79 Comm. Col.	1978-79 Total	1979-80 Sch. Dist.	1979-80 Comm. Col.	1979-80 Total	1980-81 Sch. Dist.	1980-81 Comm. Col.	1980-81 Total	1981-82 Sch. Dist.	1981-82 Comm. Col.	1981-82 Total
Pan-handle		79	79		92	92	1	69	70	1	85	86	4	81	85	8	58	66		74	74
Crown		68	68		92	92		120	120	1	108	109	1	63	64	7	59	66		49	49
East Central	166	15	181	90	28	118	98	44	142	156	55	211	168	60	228	283	87	370	107	63	170
West Central	233		233	225		225	163		163	185		185	136		136	158		158	285		285
South	269	139	408	90	88	178	128	62	190	276	55	331	215	139	354	417	68	485	264	72	336
State	668	301	969	405	300	735	390	295	685	619	303	922	524	343	867	873	272	1,145	656	258	910

Source: Florida Department of Education, Divisions of Community Colleges and Vocational Education, 1983

Note: Sch. Dist. = School District
Comm. Col. = Community College

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TABLE 67

PROJECTED EMPLOYMENT IN DENTAL ASSISTING BY REGION 1984-89

Region	Employment		Average Annual Openings [a/]
	1984	1989	
Panhandle	653	835	36
Crown	894	1137	49
East Central	1234	1616	76
West Central	2332	3175	169
South	3172	4062	178
State	8285	10825	508

a/ Derived by Postsecondary Education Planning Commission staff.

Source: Florida Occupational Information System, 1983

TABLE 68

PROJECTED ANNUAL AVERAGE OPENINGS AND
NUMBER OF STUDENTS COMPLETING AND PLACED BY REGION

Region	Annual Average Openings 1984-89	Number Completing 1981-82	Number Placed 1981-82
Panhandle	36	34	23
Crown	49	48	51
East Central	76	51	30
West Central	169	101	71
South	178	159	123
State	508	393	298

Source: Florida Occupational Information System and Department of Education, Divisions of Community Colleges and Vocational Education, 1983

RECOMMENDATIONS

Supply and Demand

The State of Florida has twenty-four dental assisting programs in its community colleges, area vocational centers and proprietary schools, with a total enrollment of 1494 students.

23. The State should not expand the number of dental assisting programs.

24. If student demand continues to drop for dental assisting programs, consideration should be given to enrollment reductions or possible termination.

Placement Standards

The placement rates for dental assisting vary by program and by region. The State Board of Education has recently adopted a 60 percent placement standard for all public postsecondary vocational programs. The Commission recommends that all programs that do not achieve a 75 percent placement rate be reviewed.

25. Dental assisting programs which have placement rates less than the 60 percent standard adopted by the State Board of Education should be reviewed by the State Board of Community Colleges and the Division of Vocational Education for possible adjustment or termination. The placement standard should be revised to 75 percent during the second five-year cycle of program reviews.

Improved Information Collection

As the placement information becomes more central to statewide policy analysis, it becomes more important that the enrollment, completion, and placement information be an accurate as possible. One way to improve the information is to involve the program directors more closely in the collection and reporting of the information.

26. The dental assisting program directors should be more directly involved in the collection and reporting of program information.

Program Level

Allied health programs have expanded in length considerably over the last two decades. The Commission is concerned about unwarranted expansion in the time it takes to complete a program and about a trend toward inflating the degree level associated with different vocational programs.

27. The practice of awarding Associate of Science degrees to students in dental laboratory technology programs should be reviewed by the State Board for Vocational Education. The Board should develop guidelines to determine when a field of study has reached a level requiring more technical complexity and more general education making an Associate of Science program more suitable than a certificate program.

X. DENTAL LABORATORY TECHNOLOGY AND DENTAL LABORATORY TECHNOLOGY EDUCATION IN FLORIDA

Dental Laboratory Technicians

Dental laboratory technicians primarily file dentists' prescriptions for various kinds of restorative and corrective appliances. They may do other tasks in the general area of operatory chairside assisting and education. Technicians may specialize in certain types of appliances and prostheses such as orthodontics or crown and bridge or supply dentists with a full range of laboratory services. Early in the century, most laboratory work was done by dentists but by 1960, 97 percent of laboratory work was done by technicians. There are no licensure requirements for dental laboratory technicians.

In 1980, there were 53,000 dental laboratory technicians in the U.S. Since 1977, five states have revised their dental practice acts to allow technicians to practice the "specialty" of denturism. Denturists are technicians who not only fabricate dentures, but also perform certain clinical tasks with or without the supervision of a dentist. Denturism is a controversial concept and is currently illegal in Florida.

Dental Laboratory Technology Education

Most dental laboratory technicians learn their craft on the job. However, training is available. In 1982 there were 56 dental laboratory technology programs accredited by the ADA Council on Dental Education in the United States. First-year enrollment was about 1500 students. Enrollments have been rising slowly but steadily for the last twenty years. However, in the last year dental laboratory technology programs experienced a seven percent drop. There are presently 0.9 slots per 100,000 population nationally. In Florida, the rate is 0.6 or two-thirds of the national average. Most dental laboratory technology programs are two years in length. They are offered by public and private vocational schools, two-year colleges, four-year colleges and universities. Awards granted include certificates, diplomas, A.S. degrees, and A.A.S. degrees. Minimum educational requirements are a high school diploma or GED.

Dental Laboratory Technology Education in Florida

Dental laboratory programs are offered at 10 schools in Florida: five proprietary schools, two vocational-technical centers, and three community colleges. See Table 69. The programs are approximately two years in length and award a certificate or Associate of Science degree.

Each of the five regions has at least one program. The East Central and South regions have three and four programs, respectively. The enrollment and completion rates for the five regions reflect the disproportionate distribution of the programs. The Panhandle, Crown and West Central enrollment levels and completion levels are considerably lower than the region's population percentage and conversely, the enrollment and percentage rates are higher in the East Central and South. See Table 70. A large number of dental laboratory technology students leave the program before completing. Students who have taken enough courses to learn the basics of the craft generally are considered

TABLE 69

DENTAL LABORATORY TECHNOLOGY
PROGRAMS IN FLORIDA

Proprietary Schools

Charron Williams College/Broward
Charron Williams College/Dade
Orlando College/Orange
Southern College/Orange
Tampa College/Hillsborough

Vocational-Technical Centers

Lindsey Hopkins Technical School
Northside Skills Center

Community Colleges

Pensacola Junior College
Indian River Community College
Palm Beach Junior College

TABLE 70

DENTAL LABORATORY TECHNOLOGY PROGRAMS
IN FLORIDA BY REGION
1981-82

Region	No. of Programs Public /Private	Total	Enrollment No.	Enrollment Percent	Completion No.	Completion Percent	Percent of State Population
Panhandle	1/0	1	24	3.9	5	3.8	8.8%
Crown	1/0	1	55	8.9	6	4.6	13.0%
East Central	1/2	3	167	27.2	52	40.0	15.7%
West Central	0/1	1	55	8.9	17	13.1	27.1%
South	2/2	4	314	51.1	50	38.5	35.4%
State	5/5	10	615		130		100.0%

Source: Florida Department of Education, Divisions of Community College and Vocational Education, and Florida Occupational Information Coordinating System, 1983.

by employers to be good candidates for training, regardless of whether they have completed the formal program.

An analysis of the racial and ethnic composition of the students enrolled indicate that both blacks and people of Spanish origin are represented in greater numbers than they represent of the Florida population. However, the rates decline somewhat for student completions. See Table 71.

The Supply of and Demand for Dental Laboratory Technicians in Florida

Projected employment opportunities between 1984 and 1989 will increase from 2,410 to 3,154. See Table 72. This provides for 149 annual openings. In 1981-82, 130 students completed the dental laboratory technician programs and 91 were placed. See Table 73. While the number being trained is less than the number of projected openings, the number being placed is even lower. In the East Central region the supply is more than twice the demand. The other regions have completion levels close to the number of openings expected.

TABLE 71

FLORIDA POPULATION VS. ENROLLMENT AND
COMPLETION PERCENTAGES BY RACE OR
ETHNICITY FOR PUBLIC DENTAL LABORATORY TECHNOLOGY PROGRAM
1981-1982

RACE OR ETHNICITY	PERCENT OF STATE POPULATION	PERCENT OF ENROLLMENTS	PERCENT OF COMPLETIONS
White	84.0	58.7	73.8
Black	13.8	16.5	14.3
Spanish Origin	8.8	24.3	9.5

Source: U.S. Bureau of the Census, PHC80-V-11. Florida Department of Education, Division of Community Colleges, MIS, 1983, and the Division of Vocational Education, 1982

TABLE 72

PROJECTED EMPLOYMENT IN
DENTAL LABORATORY TECHNOLOGY BY REGION
1984-89

Region	Employment 1984	Employment 1989	Annual[a] Average Openings
Panhandle	190	246	11
Crown	259	332	15
East Central	358	469	22
West Central	680	924	49
South	923	1,183	52
State	2,410	3,154	149

[a] Derived by Postsecondary Education Planning Commission staff.

Source: Florida Occupational Information System, 1983

TABLE 73

PROJECTED ANNUAL AVERAGE OPENINGS AND
NUMBER OF STUDENTS COMPLETING AND PLACED BY REGION

Region	Average Annual Openings 1984-89	Number Completed 1981-82	Number Placed 1981-82
Panhandle	11	5	3
Crown	15	6	3
East Central	22	52	51
West Central	49	17	15
South	52	50	19
State	149	130	91

Source: Florida Occupational Information System and Department of Education, Divisions of Community Colleges and Vocational Education, 1983

RECOMMENDATIONS

Supply and Demand

Dental laboratory programs are offered at 10 schools in Florida including five proprietary schools, two area vocational centers, and three community colleges.

28. The State should not expand the number of dental laboratory technology programs.

29. If student demand continues to decline, consideration should be given to terminating programs in the East Central area.

30. If demand for students or employers rise, consideration should be given to expanding the capacity of the program in the West Central region.

Placement Standards

The placement rates for dental laboratory technology vary by program and region. The State Board of Education has recently adopted a 60 percent placement standard for all public postsecondary vocational programs. The Commission recommends that all programs that do not achieve a 75 percent placement rate be reviewed.

31. The dental laboratory technology programs which have placement rates less than 60 percent standard adopted by the State Board of Education should be reviewed by the State Board of Community Colleges and the Division of Vocational Education for possible adjustment or termination. The placement standard should be revised to 75 percent during the second five-year cycle of program reviews.

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As the placement information becomes more central to statewide policy analysis, it becomes more important that the enrollment, completion, and placement information be as accurate as possible. One way to improve the information is to involve the program directors more closely in the collection and reporting of the information.

32. The dental laboratory technology program directors should be more directly involved in the collection and reporting of program information.

Program Level

Allied health programs have expanded in length considerably over the last two decades. The Commission is concerned about unwarranted expansion in the time it takes to complete a program and about a trend toward inflating the degree level associated with different vocational programs.

33. The practice of awarding Associate of Science degrees to students in dental laboratory technology programs should be reviewed by the State Board for Vocational Education. The Board should develop guidelines to determine when a field of study has reached a level requiring more technical complexity and general education making an Associate of Science program more suitable than a certificate program.